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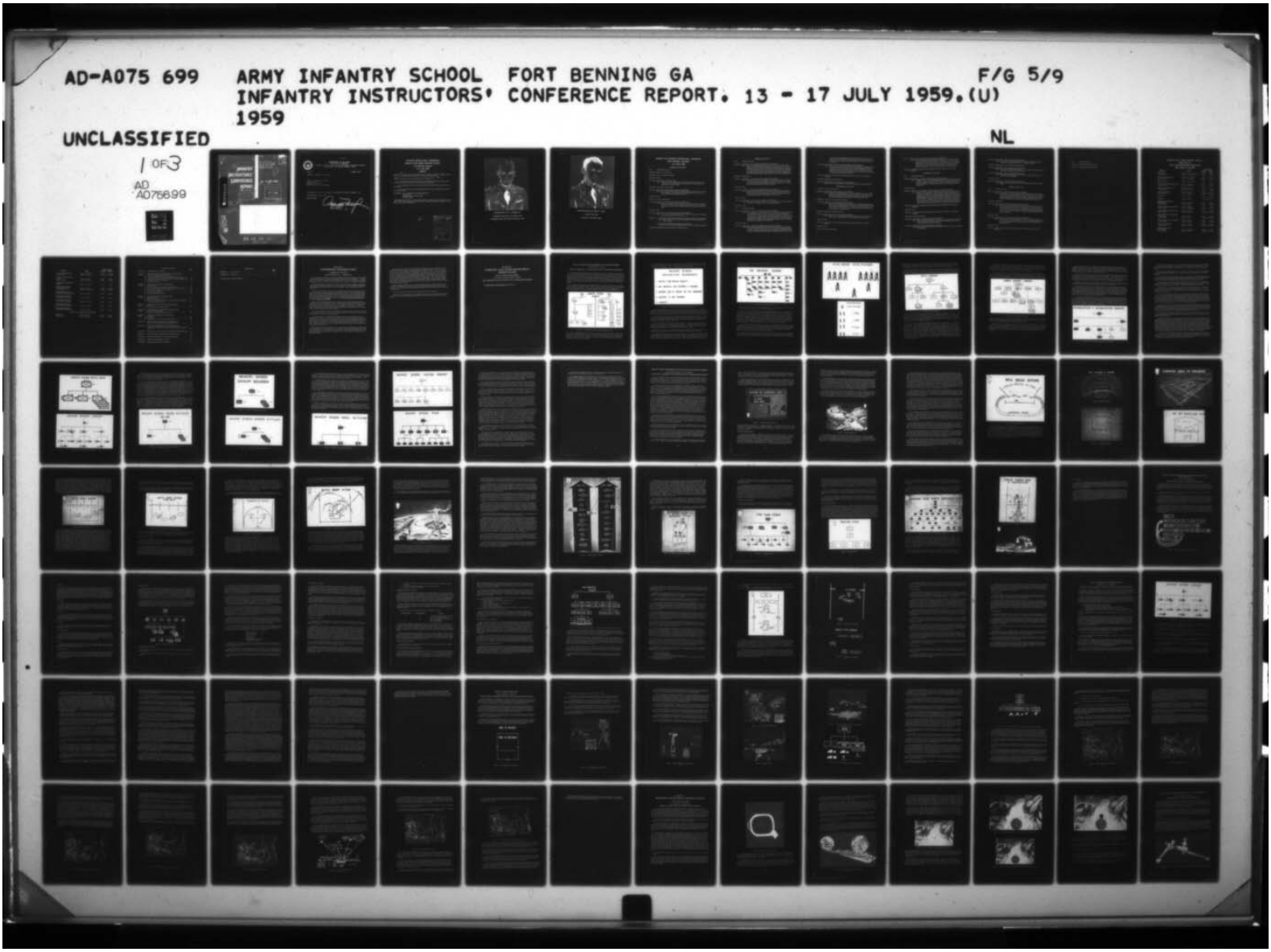

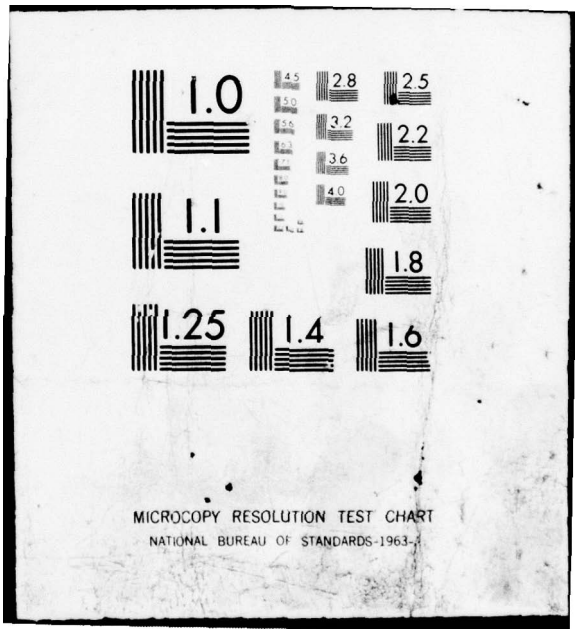
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FOR THE CHIEF:

ALEXANDER NICOLINI
Major, Infantry
R&D Coordinator

INFANTRY INSTRUCTORS' CONFERENCE
UNITED STATES ARMY INFANTRY SCHOOL
Fort Benning, Georgia
13-17 July 1959
REPORT

PURPOSE: The Infantry Instructors' Conference was convened to standardize Infantry doctrine, tactics, and technique taught at schools of the Army Educational System.

MISSION: The mission of the Infantry Instructors' Conference was:

a. To exhibit an active and constructive interest in Infantry Instructors at other service schools as primary representatives of the US Army Infantry School.

b. To bring Infantry Instructors abreast of the latest equipment, thinking, and trends in the Infantry.

c. To become informed of and to discuss Infantry Instructors' problems on an individual and collective basis.

AUTHORITY: Par 43- USCONARC TRAINING DIRECTIVE
Dtd July 1958
USCONARC Msg- ATTNG 731602
Dtd 20 Nov 1958

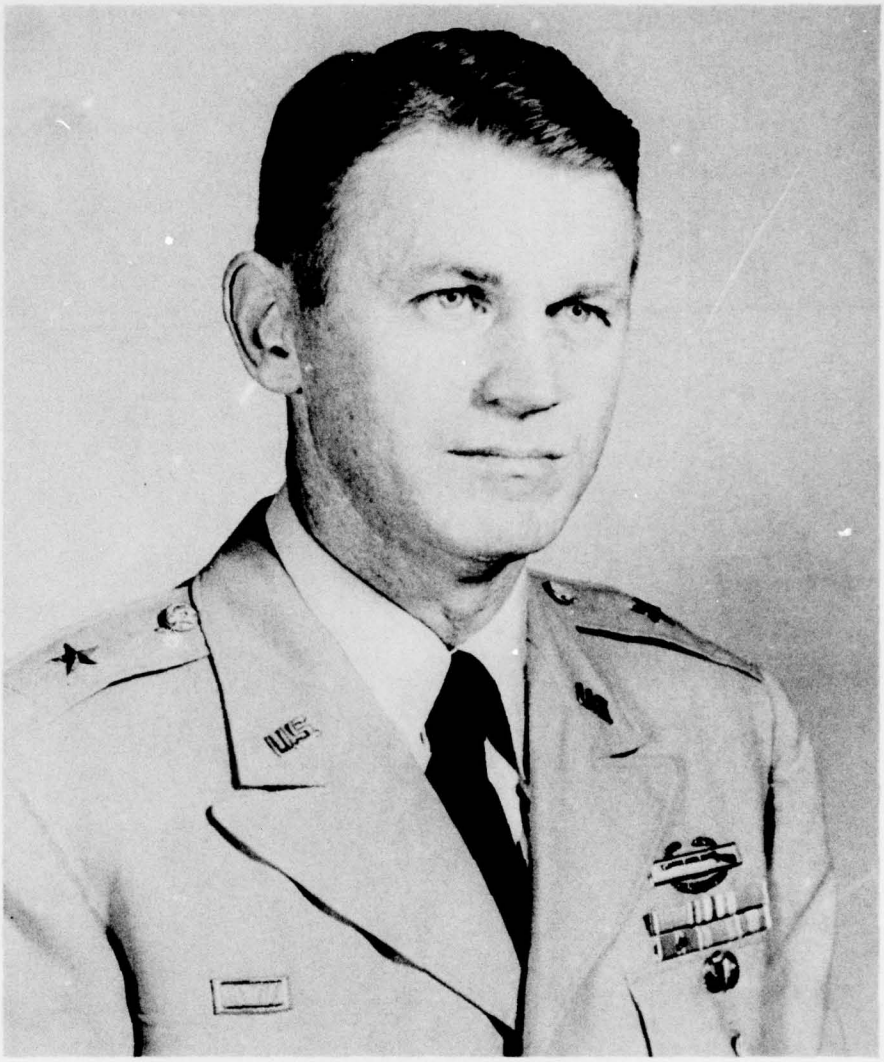
CONFEREES: Representatives of Army Service Schools, Colleges, and The Military Academy; Army Infantry Instructors at other Service Schools, Colleges and Academies, USAF Bases; and Marine Corps Schools (Appendix 1.)

-A-

MAJOR GENERAL PAUL L. FREEMAN, JR.

Commandant, United States Army Infantry School

Commanding General, United States Army Infantry Center



BRIGADIER GENERAL STANLEY R. LARSEN

Assistant Commandant

United States Army Infantry School

AGENDA FOR INFANTRY INSTRUCTORS' CONFERENCE
FORT BENNING, GEORGIA
13-17 JULY 1959

MONDAY, 13 JULY 1959

0755 Assemble Theater No. 1

0800-0810 Welcome - Commandant

0810-0900 Role of the Infantry (SECRET)

0900-0910 Break

0910-1000 Presentation: Command & Staff
Scope: Conference on the organization and equipment of the Infantry Division as reorganized by DA 28 December 1958 emphasizing the organization and equipment of the Battle Group.

1000-1020 Coffee Break at Brown Hall

1020-1200 Presentation: Special Subjects Department (SECRET)
Scope: Conference discussing nuclear weapons employment, doctrine and technique, with emphasis on the importance of the 1959 edition of DA Pam 39-1 to service school and unit training in the field.

1200-1300 Lunch

1300-1315 Enroute to Shiloh Hall

1315-1400 Presentation: Ground Mobility Department (SECRET)
Scope: Conference on present means of mobility in the Battle Group and limitations of present means; current developments that may be of use to the Infantry; and plans for mechanization of Infantry with items available now and in the future.

1400-1410 Break

1410-1500 Presentation: Ground Mobility Department (Unclassified)
Scope: Conference on organization of the army system for maintenance of ordnance equipment issued to the Battle Group.

1500-1630 a. Presentation: Ground Mobility Department (voluntary attendance) (Unclassified)
Scope: Static display, walk through, and explanation of characteristics of Infantry vehicles.

b. Conferees (not attending Ground Mobility presentation)
Conferences with instructional departments and/or observe scheduled problems.

1730-1830 Commandant's Informal Reception: BOQ Bldg 2756 A

TUESDAY, 14 JULY 1959

0755 Assemble Pratt Hall

0800-0850 Presentation: Command and Staff Department (Unclassified)
Scope: Conference on offensive and defensive employment of the Infantry Battle Group and Brigade within the combined arms and services team. Highlights the doctrinal changes in employment of the Battle Group necessitated by the reorganization of this unit directed by DA on 28 Dec 58. Considers the roles of the Deputy Battle Group Commander, the Rifle Company, and the Combat Support Company with emphasis on the tactical employment of the Assault Weapon Platoon, Heavy Mortar Platoon and the Radar Section.

0850-0910 Coffee Break

0910-1000 Presentation: Command and Staff Department (Unclassified)
Scope: To present in brief form the organization of Division Artillery. This will include information on the composition of Batteries within the Direct Support and General Support Battalions. Discuss the organization for combat and the tactical employment of these Battalions.

1000-1010 Break

1010-1100 Presentation: Command and Staff Department (Unclassified)
Scope: Organization and employment of the Infantry Division Battle Group Radar Section and the Infantry Division Aerial Surveillance Platoon; characteristics of electronic surveillance devices organic to the Infantry Division; the intelligence officer's responsibility for surveillance.

1100-1110 Break

1110-1200 Presentation: Communications Department (Unclassified)
Scope: Conference on changes in Battle Group communication personnel, equipment and systems; and status of new and proposed equipment.

1200-1310 Lunch

1310 Assemble Pratt Hall

1315-1405 Presentation: Airborne-Air Mobility Department (SECRET)
Scope: A conference on recent developments in air mobility of ground forces based on the USCONARC study, "Army Aircraft and Ground Forces Mobility 1958-1970" (U). The conference will include the purpose, background, and significance of the study; training programs resulting from the study, new organizational concepts and an inventory of material. It will also include a discussion of the merits of the several different approaches to solving the problems of air mobility for ground forces.

1405-1415 Break

1415-1445 Presentation: Airborne-Air Mobility Department (Unclassified)
Scope: A conference outlining the problems involved in current Army Pathfinder/Terminal Guidance activities to include: background development through the years, relation to unilateral airborne operations, clarification of terminology. Requirements for Pathfinder/Terminal Guidance equipment, per-

sonnel and functions generated by rapid growth of Army Aviation in order to take maximum advantage of increased mobility means for Infantry operations. Current status of planning, organization, equipment and training literature.

1445-1505 Presentation: Airborne-Air Mobility Department (Unclassified)
Scope: Panel discussion tying in Pathfinder/Terminal Guidance presentation with the type of training required by all units to obtain maximum benefits from use of Army aviation to increase Infantry battlefield mobility to include proposed subject material and program. Data, as available, pertaining to USAIS course of instruction being proposed. Units to receive such training. Advantages of air mobile training.

1505-1700 Conferences with Instructional Departments and/or Observation of scheduled problems.

2045-2100 Enroute to Fiske Night Range

2100-2300 Presentation: Weapons Department (Unclassified)
Scope: Orientation, Demonstration and Conferee Firing with the Multilite Sight.

WEDNESDAY, 15 JULY 1959

0730-0800 Enroute to Victory Pond

0800-0850 Presentation: Ranger Department (Unclassified)
Scope: Conference and demonstration to provide the conferee with a clear understanding of the Ranger Course to include procedure for enrollment; explanation of the nature of Ranger training, discussion of certain aspects of the training program and a demonstration of the confidence tests.

0850-0920 Enroute to Training Field #9 and break

0920-0940 Presentation: Ranger Department (Unclassified)
Scope: Conference and demonstration to acquaint the conferee with the origin and objective of the proposed physical fitness test to include development status and predicted effects upon future Army physical proficiency testing. Also to be included is a discussion and demonstration on the new bayonet techniques required with the M14 rifle.

0940-1010 Enroute to Pratt Hall and break

1010-1100 Presentation: Ranger Department (Unclassified)
Scope: Conference on the employment of the Rifle Squad and Platoon in offensive, defensive, and patrolling actions and individual evasion techniques.

1100-1110 Break

1110-1200 Conferences with Instructional Departments and/or Observation of scheduled problems.

1200-1300 Lunch

1300-1315 Enroute to Hook Range

1315-1515 Presentation: United States Army Infantry Board (SECRET)
Scope: A formal presentation of developmental material, dynamic firing of weapons, and a static display of key items at Hook Range. A short period for informal discussion will be scheduled in conjunction with the static display. Presentation will concentrate on material presently undergoing development and/or user tests, including field equipment, mortars, anti-tank weapons, small arms, sensory devices and target acquisition means.

1515-1700 Conferences with Instructional Departments and/or Observation of scheduled problems.

THURSDAY, 16 JULY 1959

0755 Assemble Pratt Hall

0800-0850 Presentation: Command and Staff Department (Unclassified)
Scope: Conference covering the logistical organization of the Infantry Division and the Battle Group to include the capabilities of the technical services of the Division to support subordinate units; methods of distribution from Army to Division and Division to Battle Group, and systems of resupply at Battle Group level.

0850-0900 Break

0900-0950 Presentation: Department of Non-Resident Instruction (Unclassified)
Scope: A conference which outlines the mission, organization, and major responsibilities of the department. This discussion will include comments concerning the five major non-resident programs supported--Reserve Officer Training Corps, U.S. Army Reserve Schools, National Guard State Officer Candidate Schools, Reserve Components Staff Training, and the Army Extension Courses. Emphasis will be placed on the methods of preparation of non-resident material, the means of securing non-resident material to assist instructor in their class preparation, and professional benefits that can be realized by participating in the Army Extension Course Program.

0950-1200 Conferences with Instructional Departments and/or Observation of scheduled problems.

1200-1300 Lunch

1300-1345 Conferences with Instructional Departments and/or Observation of scheduled problems.

1345-1400 Enroute to Hook Range

1400-1420 Presentation: Weapons Department (Unclassified)
Scope: Discussion and demonstration of pinless mounting system for Modified M2 Mount, packaging of machine gun ammunition and proposed revision of present machine gun training program.

1420-1435 Presentation: Weapons Department (Unclassified)
Scope: Orientation and demonstration of Incendiary Burster, M4 and Jeep-mounted Mine Detector.

1435-1520 Presentation: Weapons Department (Unclassified)
Scope: Conference and firing demonstration covering SS-10 ATGM to include organization and duties of personnel. Orientation on SS-11.

1520-1545 Coffee Break and Visit to Static Weapons Display

1545-1605 Presentation: Weapons Department (Unclassified)
Scope: Conference and firing demonstration on 4.2-inch Mortar Platoon to include organization, equipment and capabilities.

1605-1625 Presentation: Weapons Department (Unclassified)
Scope: Conference and demonstration of new GFT Fan, M16 Plotting Board and other new mortar equipment.

1625-1635 Break

1635-1655 Presentation: Weapons Department (Unclassified)
Scope: Conference and demonstration of new developments pertaining to TRAIN-FIRE I.

FRIDAY, 17 JULY 1959

0755 Assemble Pratt Hall

0800-1000 Presentation: Combat Developments Office (SECRET)
Scope: Presentation covering the latest available organizational and operational concepts for units below Division level and the projected material available to allow the implementation of these concepts. Included, also, will be a short presentation of the Combat Developments Experimentation Center's mission, capabilities and a resume of their experimentation program.

1000-1020 Coffee Break

1020-1100 Presentation: Instructor Training Section (Unclassified)
Scope: Conference to familiarize Infantry Instructors' Conference on the mission and organization of the Instructor Training Section. To familiarize conferees with the methods of instruction taught and employed at the Infantry School, with lesson organization as prescribed within the Infantry School and the types of visual aids used for instruction and experimentation within the Infantry School.

1100-1110 Break

1110-1200 Presentation: Doctrine Publications Office (Unclassified)
Scope: Conference covering the capabilities of Doctrine Publications Office, the services that are available to Infantry instructors, assistance these instructors can render the Doctrine Publications Office, and the importance of Infantry magazine.

1200-1300 Lunch

1300-1355 Conferences with Instructional Departments and/or Observation of scheduled problems.

1355	Assemble Pratt Hall
1400-1500	Assistant Commandant's Forum
1500-1515	Commandant's Closing Remarks

UNITED STATES ARMY INFANTRY SCHOOL
DIRECTORY OF
STAFF AND DEPARTMENT DIRECTORS
AND PROJECT OFFICERS

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		OFFICE	HOME
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Aide de Camp	1st Lt D. S. Rickard	5-3212	5-1417
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DOCTRINE PUBLICATIONS OFFICE	Col J. H. Hayes	5-4921	5-1927
Project Officer	Maj S. H. Winston	5-4921	5-2819
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COMMANDING OFFICER 4TH STUDENT BATTALION	Lt Col C. A. Quig	5-1323	5-4197
COMMANDING OFFICER 5TH STUDENT BATTALION	Lt Col M. O. Engen	5-1024	5-1418
UNITED STATES ARMY INFANTRY BOARD			
PRESIDENT	Col H. B. Kunzig	5-1992	5-2318
Project Officer	Maj H. U. Sieben	5-2012	5-3090

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APPENDICES

Classified Annex - Special Distribution

CHAPTER 1
CONFERENCE INTRODUCTION

COMMANDANT'S WELCOME

MAJOR GENERAL PAUL L. FREEMAN JR.

It is a pleasure to welcome you to the 1959 Infantry Instructors' Conference. We look forward to these conferences as a means of bringing you "back home" to the Infantry. I consider you, in your current assignments as Infantry instructors at the service schools, as our representatives to the other arms and services. In other words, you are our "Infantry ambassadors "

We use the Infantry Instructors' Conference to insure that you are equipped to fulfill this important role as "Infantry ambassadors." This conference is convened annually to standardize the teaching of Infantry doctrine, tactics and techniques taught throughout our defense establishment.

As you are all well aware, there is a regrettable time lag between the time that new doctrine, tactics and techniques are formulated and approved, and the time they reach you on the military newsstands as official Department of the Army literature. We at the Infantry School and you at your schools can not afford to wait for the official Department of the Army publications before teaching approved changes. To keep you informed of changes as they occur, we use such publications as the Infantry magazine, the Monthly List of Instructional Material and the quarterly Infantry School Notes.

However, here at the Infantry School we still feel we have a bigger job than to feed the changes to you piecemeal through the mails. Only through personal contact with you by means of this conference can we impart the full value of the changes that take place. So, primarily, this conference will fill you in on the significant developments and changes in the past year which have reoriented us at the Infantry School, and within the Infantry branch, in our developments, doctrinal concepts and equipment changes.

The two most significant events during the past year which will have an impact on the Infantry for a number of years to come are the World-Wide Infantry Conference and the organizational and equipment changes in the Infantry division.

As most of you know, the World-Wide Infantry Conference was conducted here at Fort Benning last December. I am pleased to note that three of the conferees at that conference are with us today. This conference was convened to take a close look at the Infantry of today and to establish cohesive positions on the organization, material and tactics it will require for the future. Pooled at the conference was the thinking of approximately 200 conferees. Ranging in rank from Under Secretary of the Army and four-star general to captain, they represented all major segments of the Army.

The conference was an outstanding success. Some of its conclusions and recommendations have been adopted here at the Infantry School. On other matters, considerable analysis is still required before they can be placed in proper perspective. During your deliberations this week, you will be informed on the results of our analyses to date as they affect our current teaching and future thinking.

This past spring, after two years of testing and evaluating the pentomic Infantry division, Department of the Army announced organizational and equipment changes. Almost every element of the division is affected. Some units gain or lose only a few men or items of equipment; others undergo a major facelifting. The changes do not materially affect the doctrine for employment of Infantry units, but provide them with a greater combat capability. An analysis of the revised organization shows considerable improvement in those areas essential to effective military operations; namely mobility, firepower, surveillance and control. All of the instruction here at the Infantry School is now in accord with these changes. This conference is particularly timely in this respect, for all of our instruction after the first of July will incorporate these changes. All of the presentations you receive this week will be based on these new organization and equipment changes.

I shall conclude now and let you get to the meat of the conference with our experts. Don't hesitate to ask questions at any time. By your careful questioning, and being constructively critical of us, of our tactics and other matters presented, you may reveal some weak points that we can improve.

We are very glad to have you here and we hope you enjoy your week with us.

I will now turn the conference over to Colonel Izenour, the Director of Instruction, who will orient you on the current organization of the Infantry School and the program for this coming week.

CHAPTER 2

COMMAND AND STAFF DEPARTMENT PRESENTATION

Section I. ROLE OF THE INFANTRY

LIEUTENANT COLONEL EDWIN C. GIBSON

Chief, Fundamentals, Review and Doctrine Section, Command and Staff Department

See Infantry Instructors' Conference Report (Classified Annex)

Section II. ORGANIZATION AND EQUIPMENT OF THE INFANTRY DIVISION

MAJOR ROBERT L. DOAK

Instructor, Fundamentals, Review and Doctrine Section, Command and Staff Department

As the United States Infantry faces the challenge of the future, one fact is increasingly evident--that the operational environment of the future will be one in which tactical nuclear weapons will either be used freely; or will, at the very least, be a threat hanging over the heads of any forces on the battlefield. Immediately discernible from this fact is the requirement for dispersion; which, in turn, creates an urgent need for increased mobility, better firepower, improved command and control, effective surveillance, and the development of an organizational structure which maximizes combat capability with a corresponding reduction in administrative support.

In recognition of this need, in 1957 the Department of the Army directed that the triangular Infantry division of World War II and the Korean War be reorganized into a division with a five-sided or pentagonal structure. As a result of lessons learned through continuous study and experimentation, the division is presently undergoing another reorganization (Figure 1).

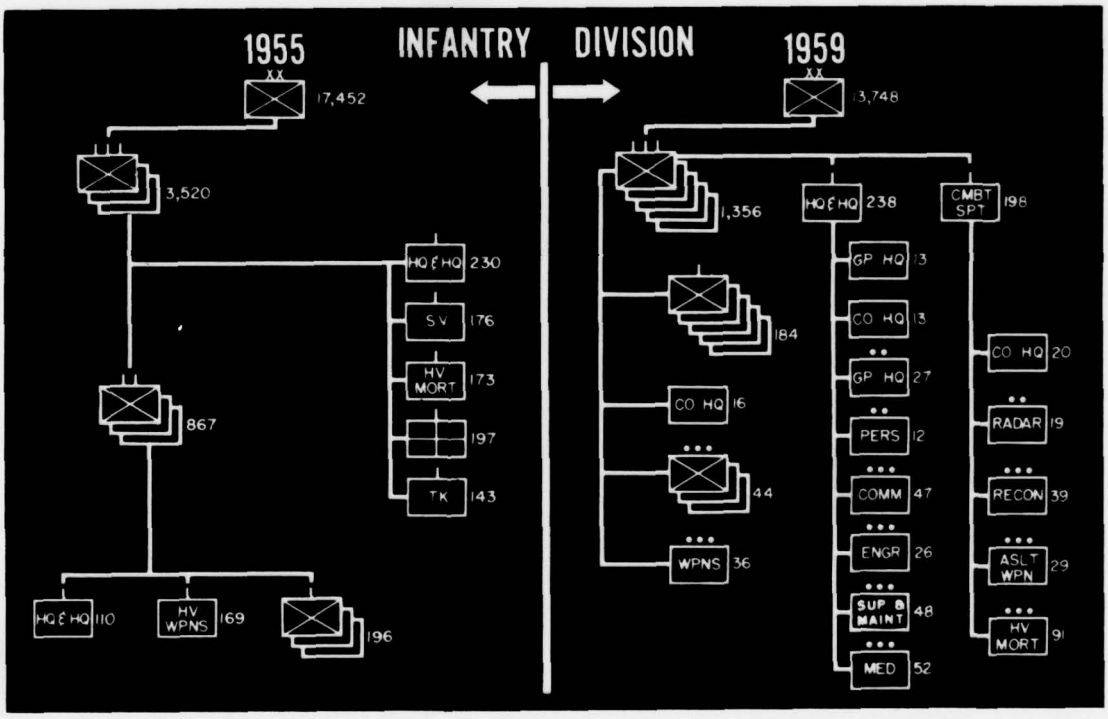

Figure 1. Comparison of Infantry Division (1955 vs 1959).

As of today, the total strength of the division is 13,748 men as against 17,452 men in the 1955 division; yet the foxhole strength, that is, the strength represented by riflemen in squads, has been increased by 288 men. The result is a lighter, leaner division with greater agility and flexibility. Instead of the three regiments we had previously, the division now has five battle groups as its basic maneuver elements.

One of the foremost features of the new division is that it possesses both nuclear and nonnuclear capabilities (Figure 2). Since we cannot be assured that future wars will be fought with or without nuclear weapons, we must be prepared for either eventuality.

Figure 2. Infantry Division Organization Requirements.

Another significant feature of the division is its adoption of the pooling concept. Items of equipment which are not used on a day-to-day basis at lower levels are pooled at a higher echelon for centralized control. This not only relieves the using unit of the maintenance burden that goes with having the equipment organic but also provides greater flexibility in its employment.

In order to shorten the reaction time to orders, the span of control is maximized. Studies indicate that the optimum number of men that one man can effectively control is three to seven. Thus in the new division, leaders command as many subordinate elements as possible, consistent with the effective control of those units.

Today we are in the midst of a transition in which we must operate with the weapons with which we are now armed, while simultaneously preparing to receive revolutionary new armament soon to be available. The pentomic Infantry division was therefore designed to enable it to absorb new materiel without requiring major organizational changes.

Finally, the new division is a highly flexible organization which can be quickly tailored to accomplish specific missions by receiving and effectively employing major attachments.

The mission of the Infantry division remains unchanged--"To destroy the enemy by offensive action employing fire, maneuver and close combat." Man is still considered the ultimate weapon in any conflict, and it naturally follows that the organization of the division and all of its materiel is geared to the support of the individual. To enable the Infantryman to accomplish his

mission of closing with and killing or capturing the enemy, we must have a balanced force of men and materiel.

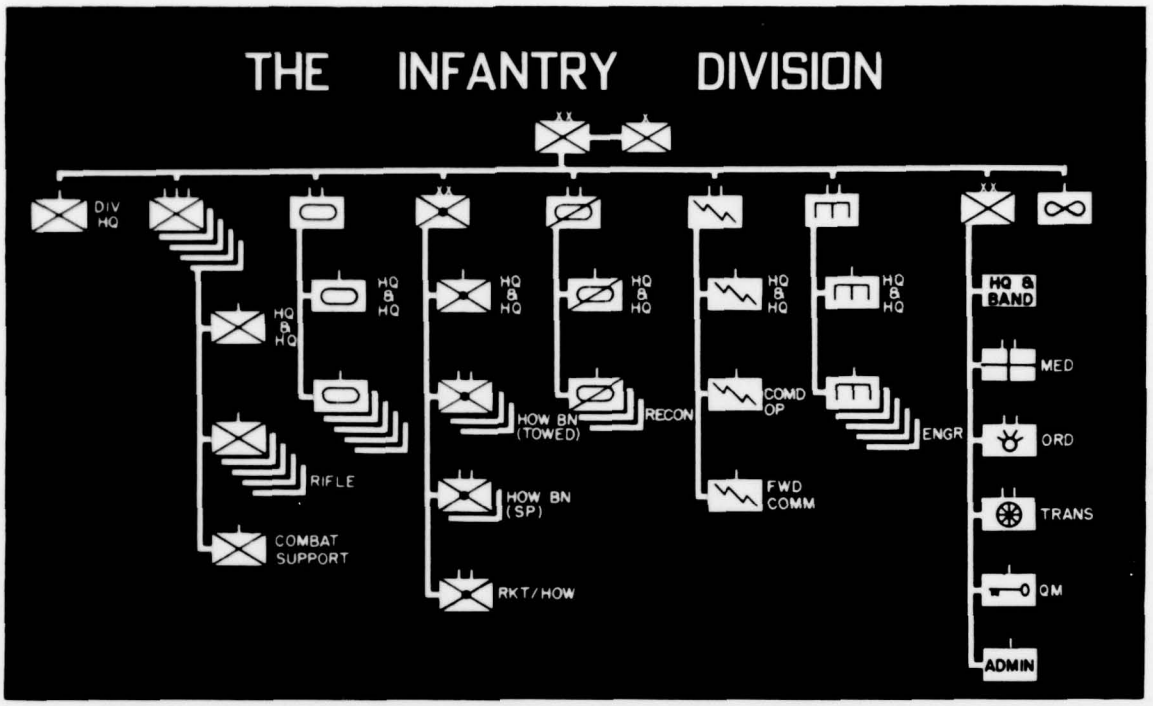

Figure 3. The Infantry Division.

In analyzing the organization, of the division (Figure 3), we will progress from the squad to the battle group and then discuss the overall supporting elements.

Since man is the basic building block of any organization, let's begin by examining the basic fighting unit in which he operates--the 11-man rifle squad (Figure 4). The rifle squad is organized into two five-man fire teams and a squad leader. These fire teams are controlled by fire team leaders or fighter leaders as they are sometimes called. In addition to the leader, the fire team consists of three men armed with the M14 rifle and one man with the M14 rifle modified. The M14 modified has the cyclic rate capability of firing 200-250 more rounds per minute than the old automatic rifle. Also organic to the squad is one radio, AN/PRC-6, for communicating within the platoon command net. There are three rifle squads organic to our present rifle platoon. They represent the basic maneuver elements of the platoon.

To give these rifle squads additional fire support, the rifle platoon is provided with a weapons squad (Figure 5). This is a nine-man organization consisting of the squad leader, a gunner and an assistant gunner for each of the two M60 machineguns, a gunner and an assistant gunner for the 3.5" rocket launcher, and two ammunition bearers. This squad also has an organic AN/PRC-6 for communicating within the platoon command net.

Overall firepower of the division has been increased in a manner that has greatly simplified logistical support. For example, adoption of the M14 rifle, the M14 rifle modified and M60 machinegun has permitted the replacement of five different weapons formerly used. In addition,

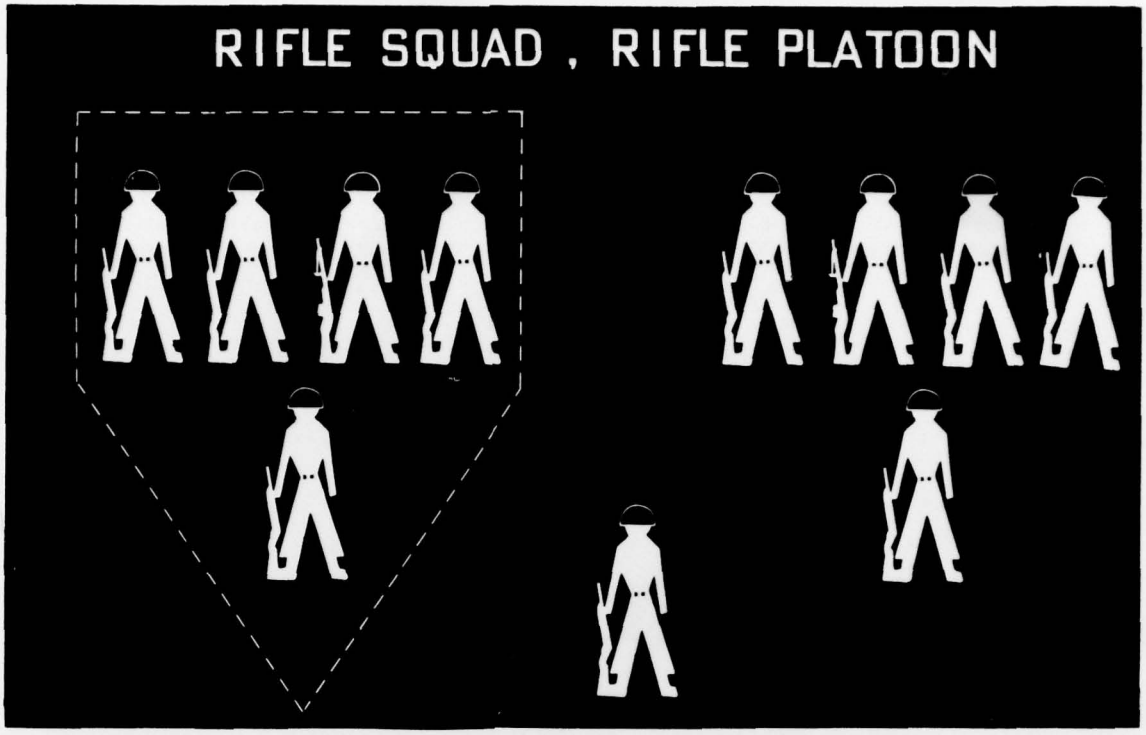

Figure 4. Rifle Squad, Rifle Platoon.

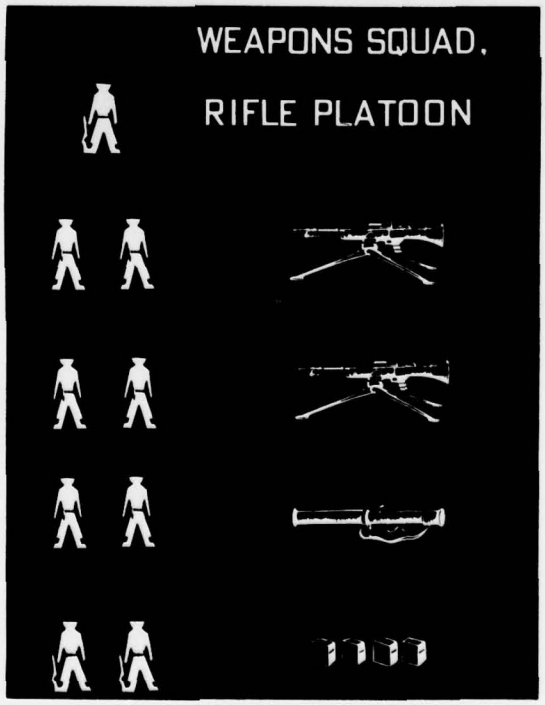

Figure 5. Weapons Squad, Rifle Platoon.

the M14 rifle and the M14 modified and the M60 machinegun fire the NATO 7.62mm cartridge, which replaces two different types formerly in use. This will considerably reduce our supply requirements and permit procurement of ammunition from other forces within NATO.

By combining the three rifle squads, a weapons squad and a control headquarters, the rifle platoon is formed (Figure 6). The platoon headquarters consists of the lieutenant, platoon leader, and a platoon sergeant. Organic to platoon headquarters are two AN/PRC-6s and one AN/PRC-10 for communicating within the platoon and company command nets respectively. Until

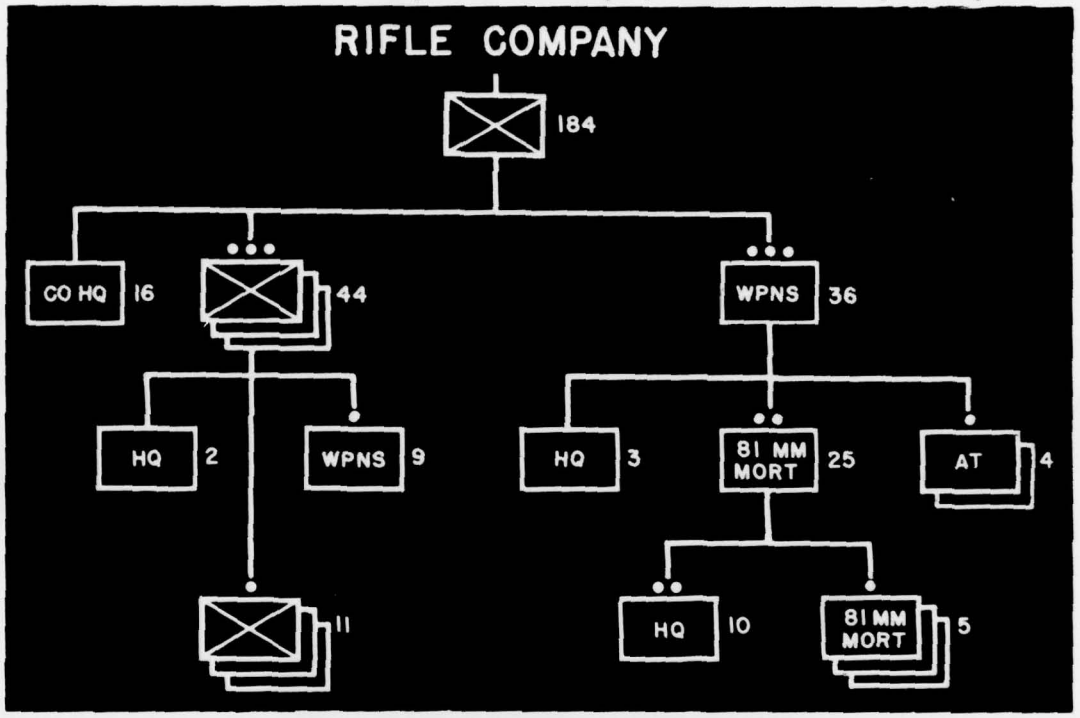

Figure 6. Rifle Company.

recently there were four rifle platoons organic to the rifle company; now there are three. The change was made for two basic reasons. First, a requirement was placed on the Infantry to organize a fifth rifle company within the then current battle group strength. In order to do this, it was necessary to utilize one rifle platoon from each of the four rifle companies. Secondly, experience proved that commanding four rifle platoons, together with the weapons platoon, was an excessive task for the company commander.

To give these units additional antitank protection and indirect fire support, a weapons platoon is provided. It is organized with a platoon headquarters, an 81mm mortar section and two antitank squads. Each of the antitank squads is equipped with a 106mm rifle mounted on a 1/4-ton truck. The weapon can be dismounted from the vehicle and employed on a ground mount when required. Each of the three mortar squads is equipped with one 81mm mortar to provide indirect fire support for the rifle platoons to ranges out to 3650 meters. Organic to the 81mm mortar section headquarters is a sergeant, section leader; 3 forward observers; 2 fire direction computers; and 4 radio-telephone operators. Within the weapons platoon headquarters, we find the lieutenant, platoon leader; a platoon sergeant; and a radio-telephone operator. Eight AN/PRC-10s are organic to this platoon--one in platoon headquarters, five in the 81mm mortar section headquarters and one with each of the two antitank squads. One weapons platoon is organic to each rifle company.

The company headquarters, through its two officers and fourteen enlisted personnel, provides command and control and administrative and logistical support for the subordinate elements of the rifle company. Control of subordinate elements is partially exercised through the five AN/PRC-10s and one AN/VRQ-3 organic to company headquarters. Commanded by a captain, the rifle company is the basic maneuver element of the battle group.

The combat support company was formed because a requirement exists within the battle group for reconnaissance, ground radar surveillance, additional antitank protection, fire support and counterfire data (Figure 7). It includes a company headquarters, a reconnaissance platoon, an assault weapon platoon, a heavy mortar platoon and a radar section. Within company

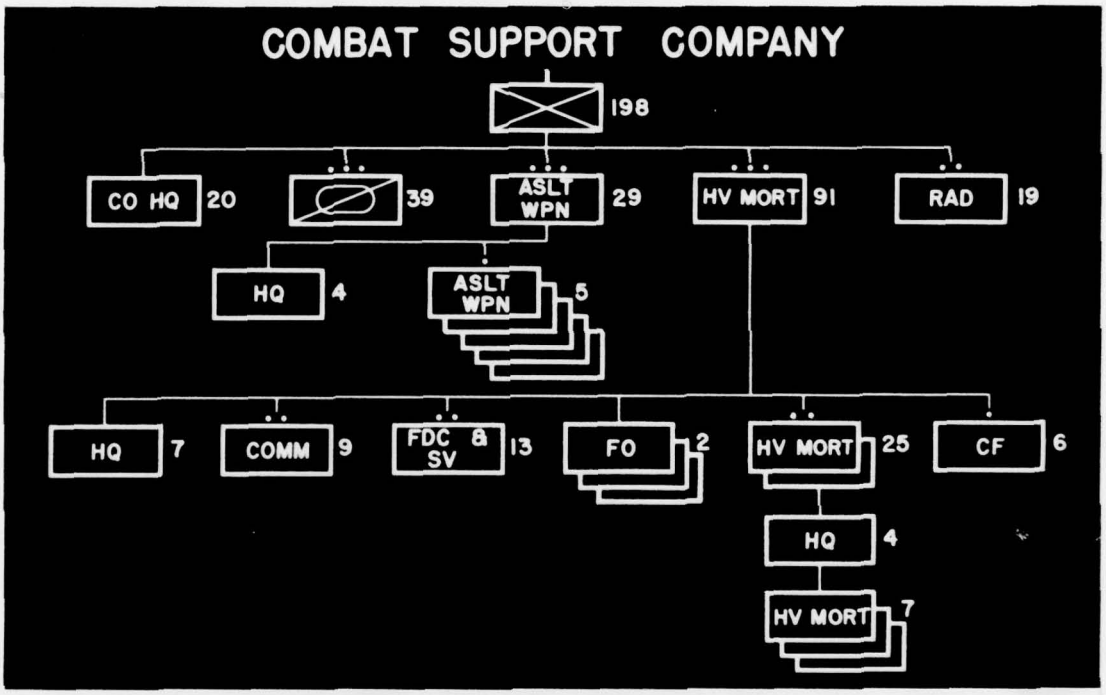

Figure 7. Combat Support Company.

headquarters, we find the captain, company commander, together with the necessary additional officer and enlisted personnel to assist in controlling the subordinate elements of the company as well as providing them administrative and logistical support.

Reconnaissance for the battle group is provided by the reconnaissance platoon. Commanded by an Armor lieutenant, the platoon is organized with a tank section equipped with two 76mm gun tanks; a scout section equipped with four 1/4-ton trucks, each mounting an M60 machinegun on a pedestal mount; a rifle squad; and a support squad. The support squad is equipped with one 81mm mortar. Both the rifle squad and the support squad are transported in M59 personnel carriers.

The assault weapon platoon, commanded by an Infantry lieutenant, includes a platoon headquarters and five assault weapon squads. It provides the battle group commander with his primary antitank defense means. One SS-10 missile launcher mounted on a 1/4-ton truck is organic to each of the five squads. The platoon may be placed in general support, or squads may be attached to subordinate units of the battle group.

Commanded by an Infantry captain, the heavy mortar platoon extends the indirect fire support available to the battle group commander out to 5500 meters. The platoon consists of platoon headquarters, communication section, fire direction center, survey section, three two-man forward observer teams and two heavy mortar firing sections. There are three mortar squads per firing section and a total number of six mortar tubes within the platoon.

In addition, the counterfire squad equipped with the AN/TNS-3 Sound Locating Set, enables the squad to pinpoint enemy weapon locations at ranges out to 3650 meters.

The radar section consists of a section headquarters, two medium-range radar teams of three enlisted personnel each, and five short-range radar teams of two men each. The short-range radar known as the AN/PPS-4, or "Silent Sentry", is an all-weather radar for detecting and locating moving targets within line-of-sight ranges up to 6000 meters. The medium-range radar, AN/TPS-21, is a personnel and vehicle detector similar to the AN/PPS-4. However, the AN/TPS-21 is larger and has greater range capabilities. It detects and locates moving targets within line-of-sight ranges up to 20,000 meters.

To effectively command and control the five rifle companies and the combat support company, the battle group headquarters was organized as an element of headquarters and headquarters company (Figure 8). The battle group is commanded by a colonel who is assisted by a deputy battle group commander, an executive officer, and a complete unit staff: S1, 2, 3 and 4. The headquarters company, commanded by a captain, provides administrative and logistical support for the subordinate elements of the battle group.

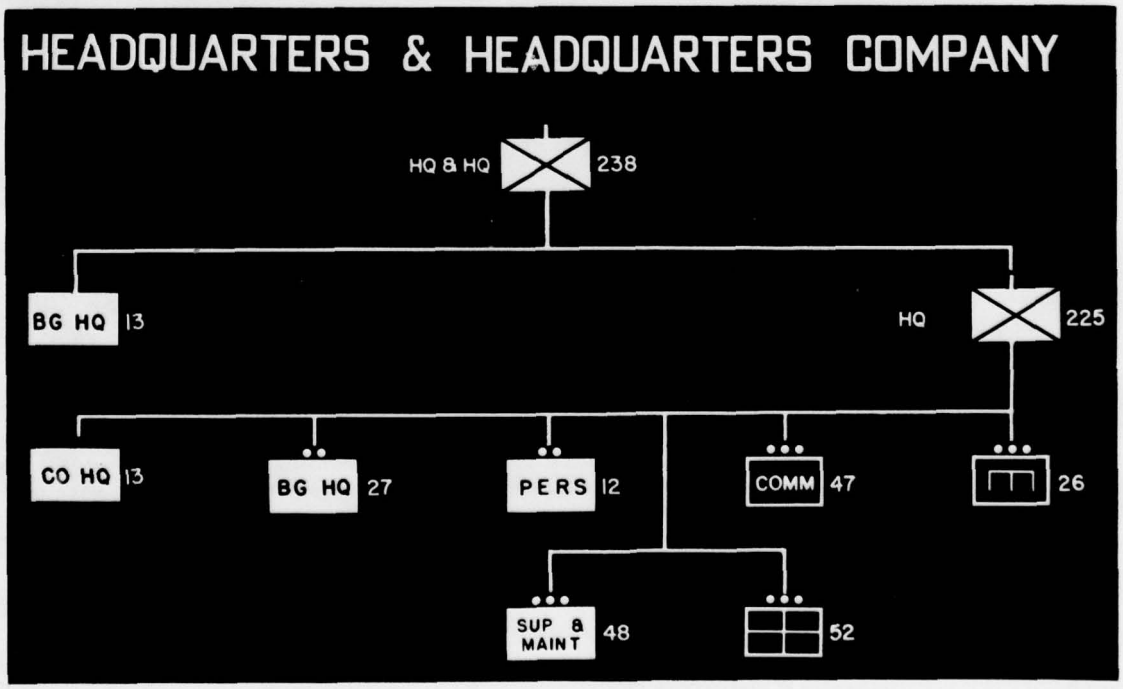

Figure 8. Headquarters & Headquarters Company.

The battle group headquarters section contains principally officer and enlisted personnel who assist the battle group staff. The five officers are all captains: an assistant S2, assistant S3, an assistant S3 for air and two liaison officers. In addition, there are 22 enlisted personnel.

The personnel section, headed by a warrant officer, maintains the records of all assigned and attached personnel in the battle group. It operates under staff supervision of the battle group S1.

The communication platoon assists the battle group commander by establishing a radio and wire net to effectively control subordinate elements of the battle group. It is commanded by a Signal Corps lieutenant and operates under staff supervision of the battle group S3.

The engineer platoon furnishes engineer support to the battle group. It is commanded by an Engineer lieutenant and is organized with a platoon headquarters and three engineer squads. Organic to each of these squads is one 2 1/2-ton dump truck with pole-type trailer.

At platoon level is one diesel-driven scoop loader, commonly known as the "Huff Bucket Loader," which provides the battle group with an organic earth-moving device. It is a pneumatic-tire tractor with a 1 1/2 cubic yard load scoop. Other accessories include a dozer blade, a fork lift and a crane hook.

The supply and maintenance platoon provides the battle group with necessary logistical support. It is commanded by a captain who also operates the battle group supply and service area, which is the focal point for logistical operations within the battle group. He is assisted by two warrant officers; one for maintenance and one for supply. The platoon, which operates under the staff supervision of the S4, is organized with an ammunition squad and a truck squad. The ammunition squad operates the ammunition supply point and replenishes ammunition as required. The truck squad has organic seven 2 1/2-ton trucks and trailers.

The medical platoon is commanded by a Medical Corps captain and provides medical treatment and evacuation for casualties. It is equipped with 14 frontline ambulances for evacuation of casualties from the forward elements of the battle group to a battle group aid station, where the casualties are given emergency-type treatment and either sent back to their units or prepared for further evacuation to the division or Army medical installations.

The battle group, consisting of the headquarters and headquarters company, the combat support company, and five rifle companies, represents the basic maneuver element for the Infantry division (Figure 9).

In addition to backing up the five battle groups with indirect fire support at ranges out to 24,500 meters, the division artillery provides the division with an organic nuclear weapons delivery capability (Figure 10). The artillery is commanded by a brigadier general. In combat, the division artillery headquarters will establish itself as an alternate division command post. The division artillery is organized with a headquarters and headquarters battery; five direct support battalions, of which three are towed and two self-propelled; and one general support rocket/howitzer battalion. Organic to each of the three towed direct support battalions is a headquarters and headquarters battery; one 105mm howitzer battery, consisting of six tubes; and one 155mm howitzer battery, also consisting of six tubes. Organization of the two self-propelled direct support battalions is identical except that tubes are mounted in track vehicles.

Organic to the rocket/howitzer battalion is a headquarters and headquarters battery; an 8-inch towed battery, consisting of four tubes; and an Honest John Rocket battery, consisting of two launchers. The 8-inch howitzer battery and the Honest John Rocket battery provide the division with the organic means for delivering a nuclear warhead.

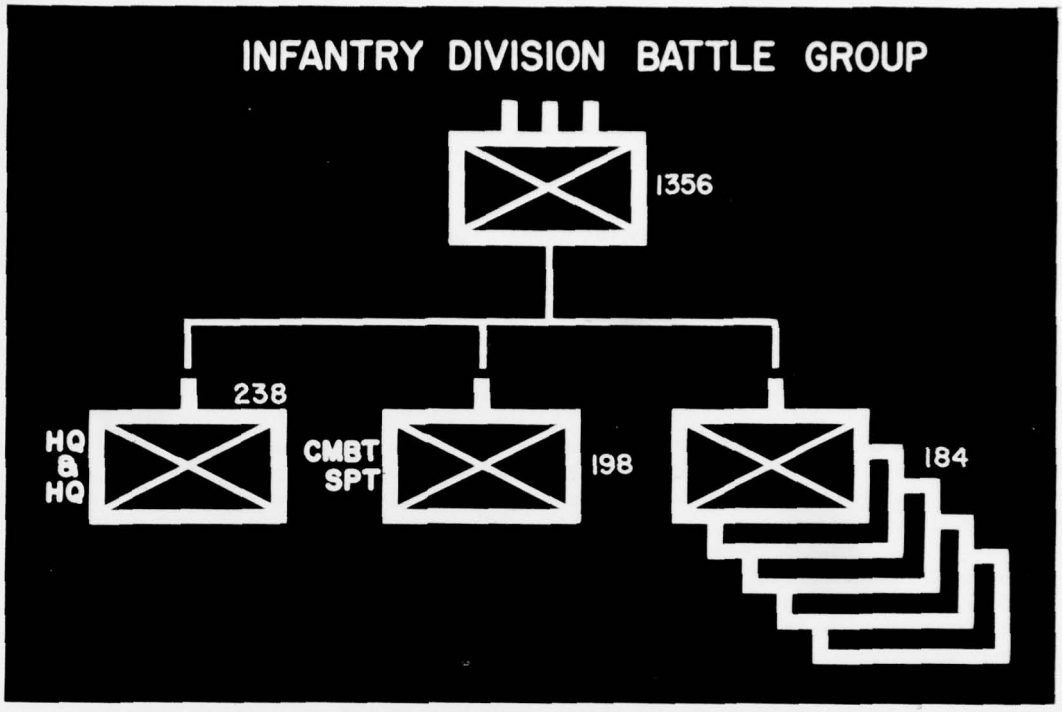

Figure 9. Infantry Division Battle Group.

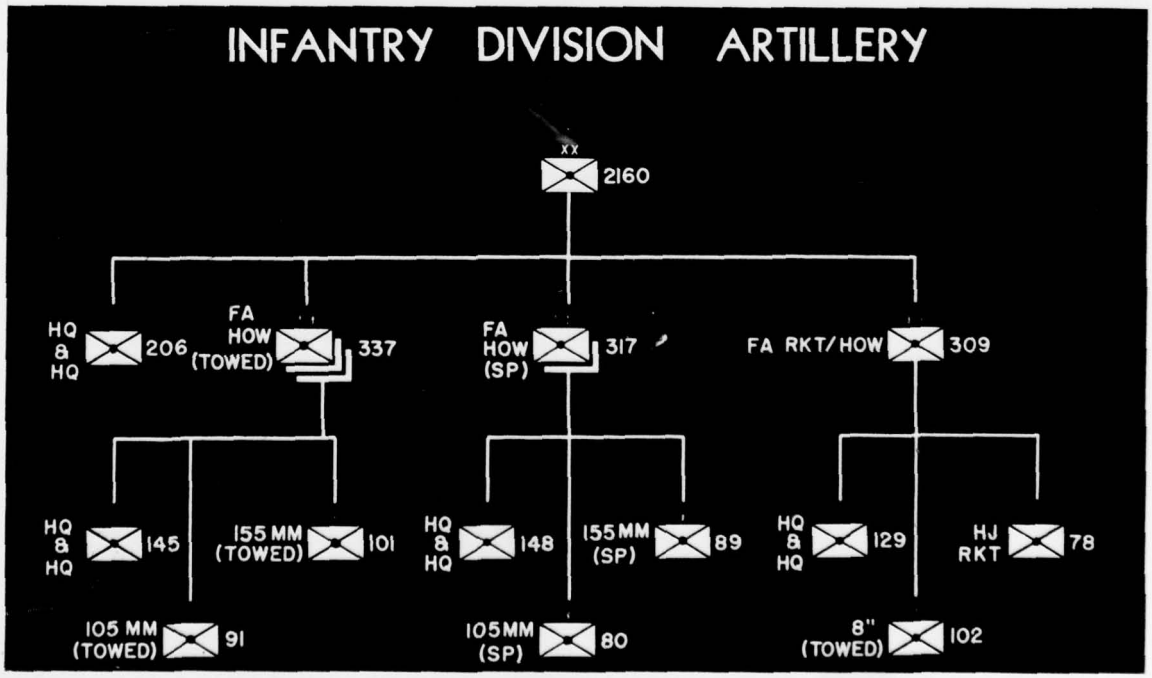

Figure 10. Infantry Division Artillery.

Tank support for the division is provided by the armor battalion (Figure 11). It is a pentagonal organization with a headquarters and headquarters company and five tank companies. Each of the tank companies is equipped with seventeen M48 tanks. The battalion is capable of being employed as a unit, or tank companies may be attached to the battle groups to further enhance their capability for ground combat.

The Infantry division cavalry squadron performs reconnaissance and provides security for the unit to which it is assigned or attached (Figure 12). It can engage in offensive, defensive, and delaying action as an economy of force unit. It is organized with a headquarters and headquarters troop and three armored cavalry troops. The headquarters and headquarters troop furnishes command, administration, supply and maintenance for the squadron. The armored cavalry troop has organic to it a troop headquarters and three armored cavalry platoons. These platoons are organized similarly to the reconnaissance platoon of the Infantry battle group in that they have a platoon headquarters; a tank section employing two light tanks; a scout section which utilizes four 1/4-ton vehicles, each mounting an M60 machinegun; a rifle squad consisting of twelve men, one of which is a driver for the M59 personnel carrier; and a support squad. Organic to the support squad is a self-propelled full-tracked 4.2-inch mortar.

The Infantry division engineer battalion increases the combat effectiveness of the division by means of general engineer work (Figure 13). The battalion provides fixed bridging for short gaps, general construction, repair and maintenance of landing strips, roads, bridges, fords, and culverts. It can also prepare and execute demolitions including employment of pre-positioned nuclear weapons. It is responsible for water purification and supply throughout the division area. It must also provide maps for the division. The battalion is pentagonal in design, having a headquarters and headquarters company and five engineer companies.

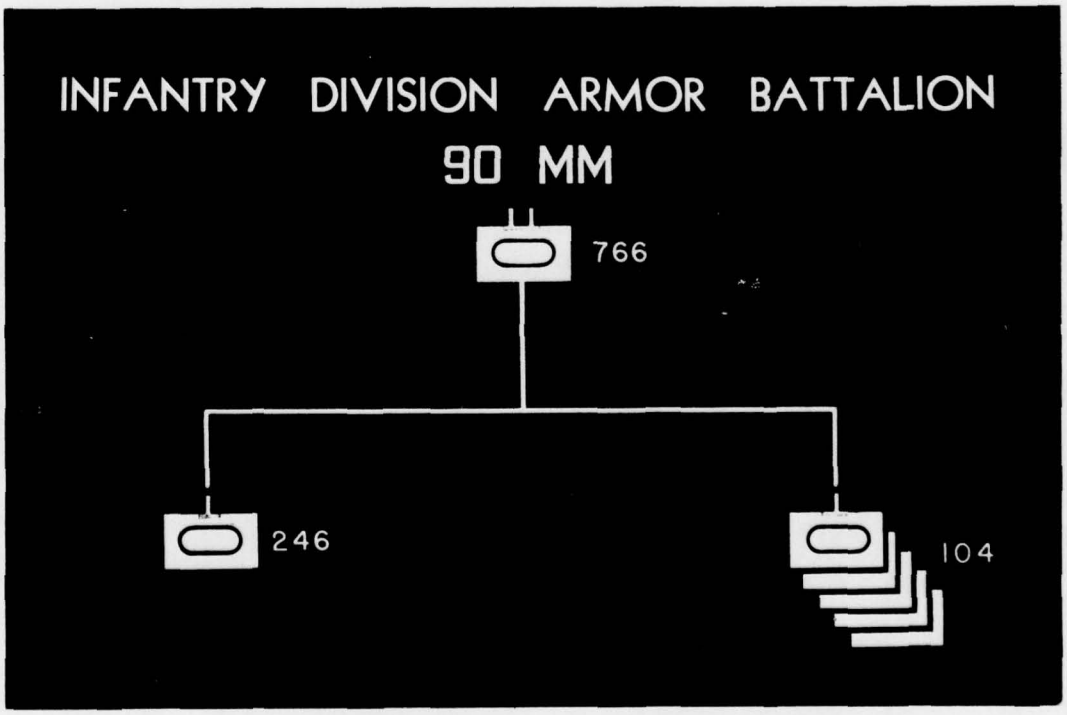

Figure 11. Infantry Division Armor Battalion.

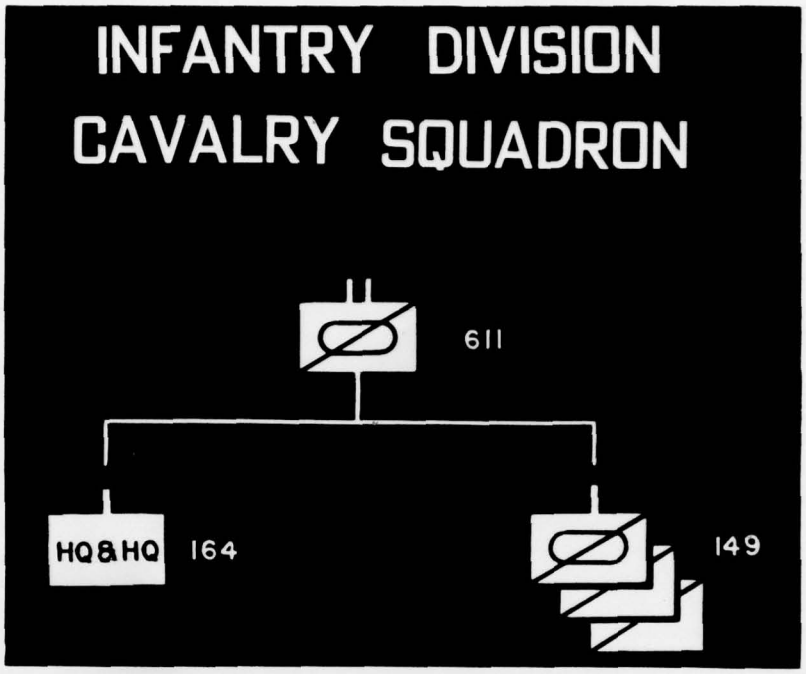

Figure 12. Infantry Division Cavalry Squadron.

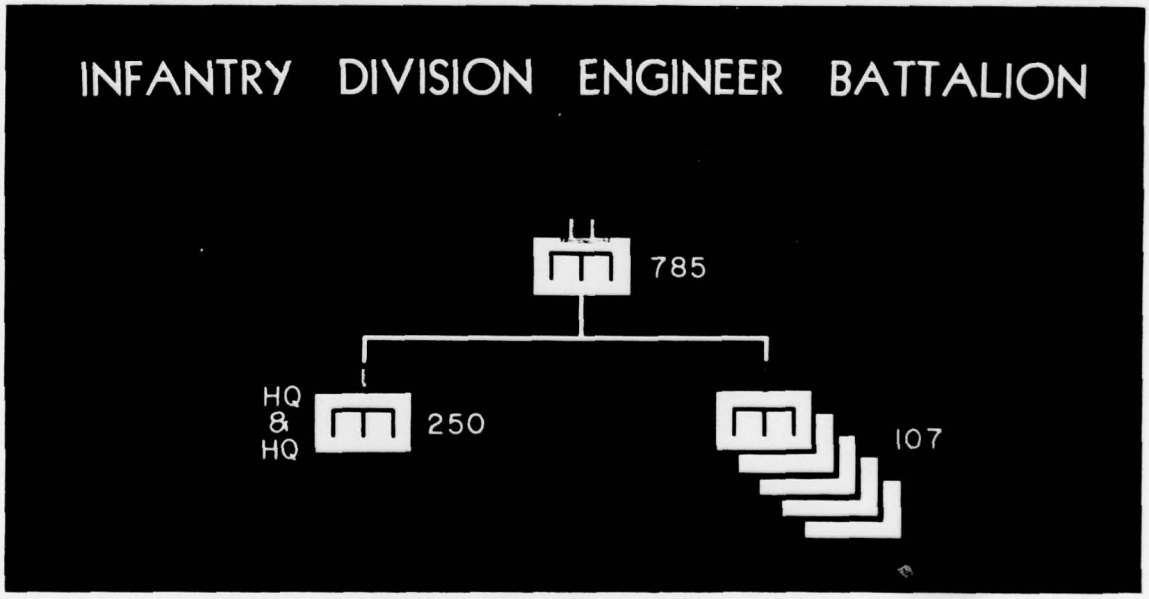

Figure 13. Infantry Division Engineer Battalion.

A recent addition to the engineer battalion is the combat engineer vehicle. Mounted on this vehicle is a 165mm demolition gun with a maximum range of 3200 meters. It has the capability of destroying timber obstacles, derelict tank hulls and reinforced concrete blocks. Twin booms and dozer blades further enhance the vehicle's usefulness.

The signal battalion assists the division commander in controlling the units of the division (Figure 14). The battalion is organized with a headquarters and headquarters company, a command operations company and a forward communication company. The battalion establishes an area communication system by installing a signal center in each battle group area. The battle group ties in its wire net to the signal center. In addition to wire, the center is equipped with radio, radio relay and teletypewriter. If one of the signal centers is destroyed, another center can pick up the flow of communication traffic and maintain continuous communication throughout the division area.

Air mobility has been increased in the new division giving it greater capabilities in the concentration and dispersal of combat forces. Organic aviation now has 49 fixed and rotary wing aircraft. The pooling concept is exemplified, for within the aviation company we find all of the aircraft which are organic to the division--to include those used for reconnaissance and surveillance as well as those used for the adjustment of artillery fires (Figure 15). Currently included in the company are 22 fixed-wing aircraft: the L19, the L20 and the MOHAWK; and 27 rotary-wing aircraft: the H13 or H23, the H19 or HU1A, and the H21 or H34.

Within this organization, we also find the aerial surveillance platoon consisting of a section of 12 drones, a visual and photo surveillance section, a platoon headquarters, an aerial radar section, and two tracking and plotting teams. With the use of airborne sensory devices on drones, the combat surveillance and target acquisition systems organic to the battle groups are extended out beyond 20,000 meters.

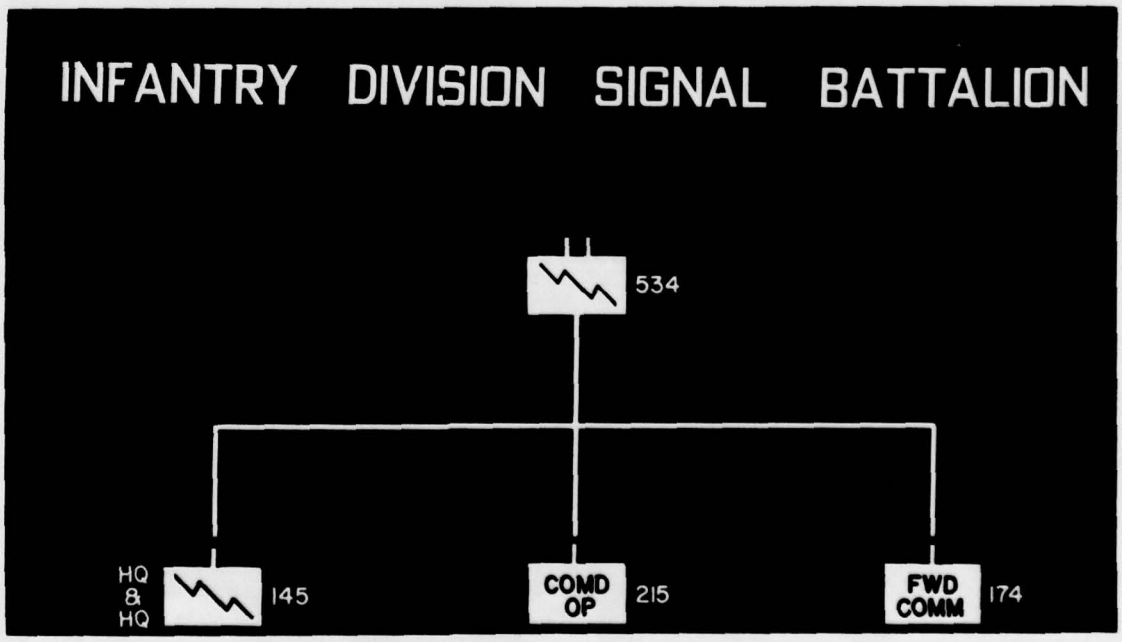

Figure 14. Infantry Division Signal Battalion.

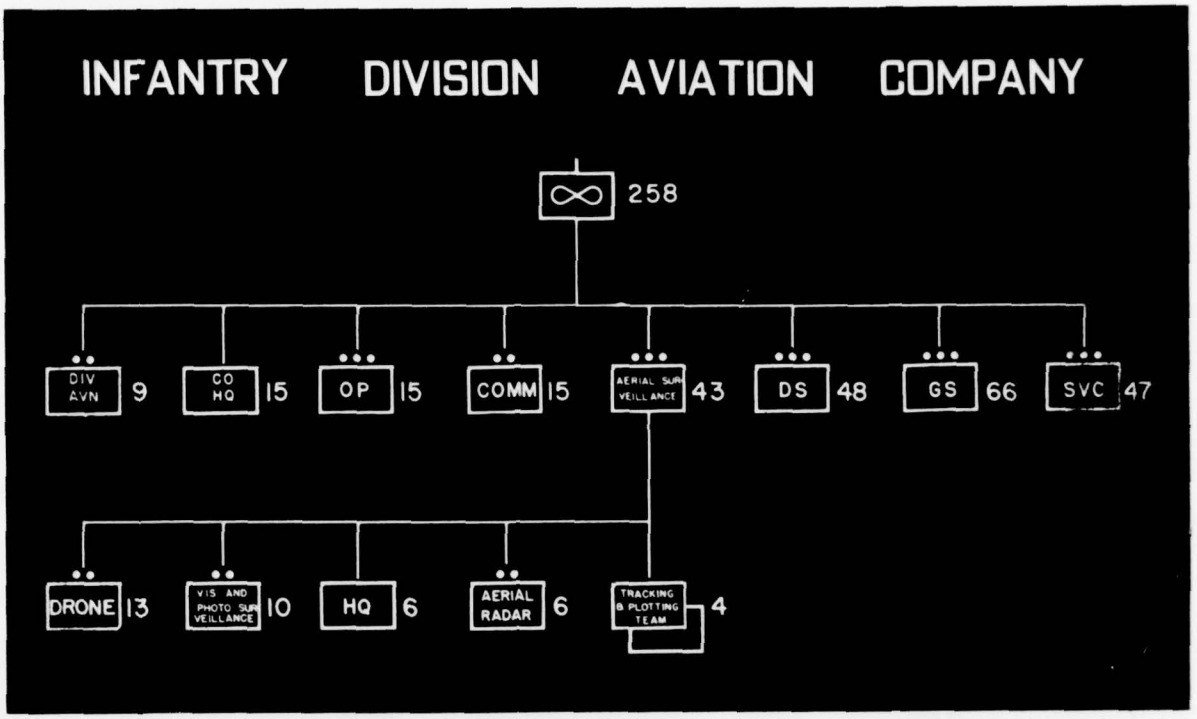

Figure 15. Infantry Division Aviation Company.

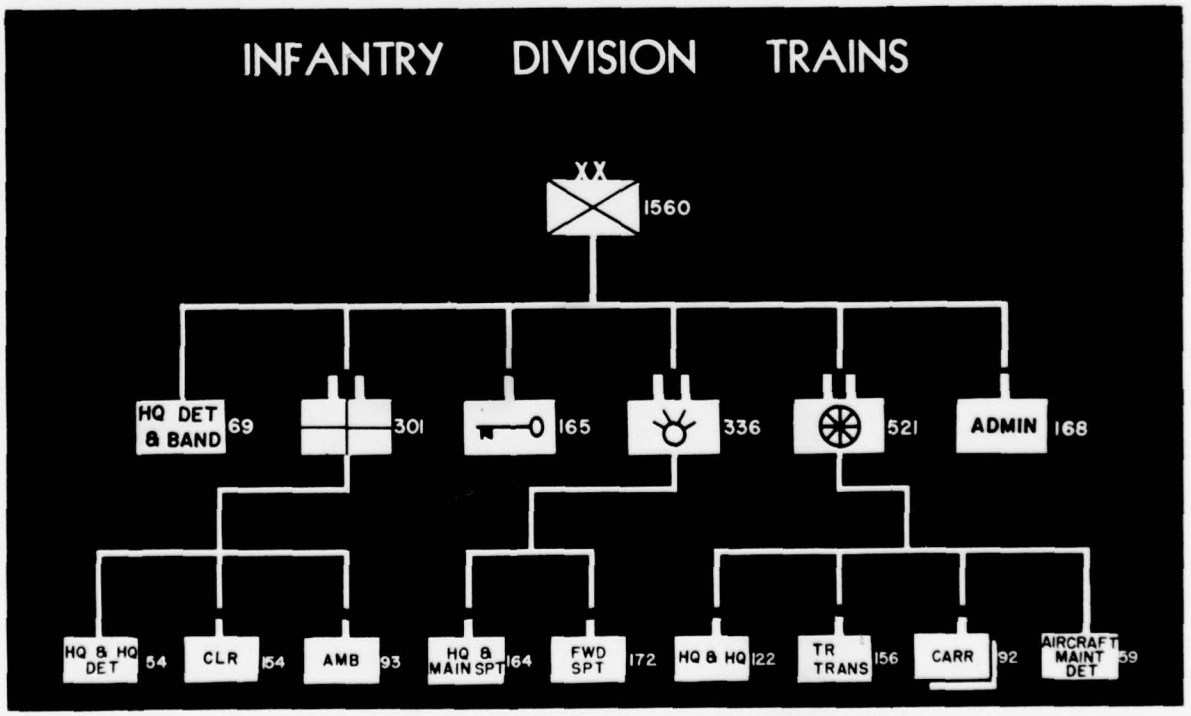

Figure 16. Infantry Division Trains.

In the division trains are found the service support elements of the division (Figure 16). The trains headquarters is a tactical headquarters. The commander, an Infantry colonel, who is assisted by an executive officer and an S1, S2 and S3, is a tactical commander and is therefore responsible for the tactical training of subordinate elements of the trains. The personnel who staff the headquarters are found in the headquarters detachment and band. The band provides the division with music and the trains headquarters with a security force.

The medical battalion is organized to provide evacuation of casualties, using the 3/4-ton enclosed ambulance, from the forward elements of the division to clearing stations established by the clearing company. Here the casualties are given emergency-type treatment and either sent back to their parent units or prepared for further evacuation to Army medical installations.

The quartermaster company is responsible for supplying the division with quartermaster items of supply including food and gasoline. Additionally, this unit provides a bath service for the division. When the division is committed to combat, the quartermaster company is augmented by a memorial activities platoon which has the mission of collecting, identifying and evacuating the dead.

The administrative supervision of the resupply of ammunition for the division is provided by the ordnance battalion. It is organized with a headquarters and main support company and a forward support company. The forward support company is organized into platoons, one of which will be in direct support of each of the battle groups. The mission of the direct support platoon is to assist the battle group perform its second echelon maintenance and to perform third echelon maintenance in the forward area. This reduces the time that the combat unit is without an item of equipment. Repair parts are maintained by the forward support company and a back-up supply is found within the headquarters and main support company.

Mobility in the division has been increased even though there are fewer vehicles than in the old triangular division. This was accomplished by the reduction in personnel strength in the new division, the functional assignment of vehicles on a "need" basis and by the pooling of vehicles in the transportation battalion for centralized control. The transportation battalion is organized into a headquarters and headquarters company, two armored carrier companies and a truck transport company. The carrier companies, with a total of 114 personnel carriers, have the capability of mechanizing the foot elements of nine rifle companies. The truck company is equipped with 80 2 1/2-ton trucks. Using these trucks, the foot elements of approximately 2 1/2 battle groups can be completely motorized. Also organic to this battalion is an aircraft maintenance detachment which can provide third echelon maintenance support to division aircraft and requisition-transmitting facilities to the division aviation company.

The administration company carries on the functions formerly performed by the old administrative center. Organic to this unit are some of the various staff sections of the division headquarters; i.e., IG, SJA, etc. This unit performs the personnel services for the division including a replacement system.

The Infantry division is commanded by a major general. He is assisted by an assistant division commander, a brigadier general, and by a complete staff. Of particular interest is the brigade headquarters, which is commanded by the assistant division commander. He is assisted by a deputy and an S1, 2, 3, and 4. The brigade itself has no organic units, but at the discretion of the division commander, Infantry, Artillery and Armor units can be attached to accomplish specific task force operations. Additionally, the brigade has the mission of operating an alternate division command post in combat in order to provide flexibility.

The personnel who staff both the division and brigade headquarters are found in the headquarters and headquarters company. Also in this unit are the division military police and a security platoon to provide security for the division command post in combat.

In summary, the Infantry division is a combined arms team, predominantly Infantry, but supported by Armor, Artillery and other arms and services.

The organization described represents a step in the Army's effort to achieve a greater combat capability through an evolutionary process. Undoubtedly other changes will follow. In any event, as the remodeling of the Army continues, it is a certainty that Infantry will continue to play its time-honored role. For "In the final analysis," our former Army Chief of Staff, General Maxwell D. Taylor, has stated emphatically, "all our efforts toward improvement seek but one principal end. It is to provide the Infantry, as the versatile basic arm of close combat, with a superior differential of sustained, mobile combat power, capable of delivery at the decisive point in time and space, under any and all conditions of combat."

Section III. TACTICAL EMPLOYMENT OF THE INFANTRY BATTLE GROUP AND BRIGADE

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The future battlefield is seen as an area which has no lines of entrenchments as we have known them in the past. There will be no masses of men waiting in reserve, no roads jammed with trucks moving to the front. In fact, there will be no front--only a battle area. Within this battle area, to depths as much as 150 kilometers or more, highly mobile units will be deployed with intervals measured in kilometers rather than meters.

As a first step in the transition to this battlefield, the pentomic Infantry division was adopted. After two years of testing and evaluating this division, Department of the Army recently announced new organizational and equipment changes. These changes do not materially affect the doctrine for employment of the Infantry division battle group, but provide it with a greater combat capability. An analysis of the revised organization shows considerable improvement in those areas essential to effective military operations; namely mobility, firepower, surveillance and control.

The most obvious changes are the creation of a fifth rifle company and a combat support company. By returning the rifle company to a triangular structure, the company commander is relieved of the overburdening task of commanding four maneuver elements. By concentrating all the tactical support of "fighting" elements of the battle group in a separate company, a desirable reduction in the strength of the headquarters company is achieved and, as a result, greater efficiency is provided. The fifth rifle company and the combat support company enhance the battle group commander's flexibility and thereby increase his ability to strike the necessary balance between dispersion and concentration of his overall force. While his span of control is increased, compensation is provided by the creation of a deputy battle group commander. As experience in the airborne division already proves, this individual will be invaluable to the commander in coping with the problem of control on a porous battlefield. When necessary, the deputy uses the facilities in the combat support company headquarters to establish an alternate command group.

Preliminary study indicates that orders to the individual platoons of the combat support company will come direct from the battle group headquarters and that the staff sections concerned will have primary interest in their tactical employment. However, the company commander's job will not be solely administrative, since it is anticipated that the company headquarters may be used as an alternate command post to supervise rear area security or to help accomplish any other job the situation may demand.

How will the new battle group be deployed on the future battlefield? First, let us consider the battle group in the defense, then the battle group in the attack, and finally task force operations and operations of the Infantry brigade.

The tactical concepts to be discussed are applicable to either nuclear or nonnuclear war. While narrower frontages may be required in some nonnuclear situations, the decrease will be small due to the threat of enemy nuclear employment. Meanwhile, development is proceeding on nonnuclear weapons and munitions whose saturation effects will invoke dispositions similar to those for nuclear defense, thus permitting operation under one doctrine whether hostilities are purely nuclear or nonnuclear in nature.

The effective employment of any unit depends upon a proper consideration of the mission, enemy, terrain, weather, troops and supporting fires available. No attempt will be made to

analyze these factors in this disucssion since it will be assumed that optimum conditions prevail. It is not implied, however, that the frontages mentioned may be applied like a template on any piece of ground. The terrain and other factors will modify these distances, and each situation must, of course, be analyzed individually.

The concepts to be presented are based on the weapons, munitions, communications, and surveillance equipment organic to the new battle group. Special account was taken to the possible advent of subkiloton yield nuclear weapons which will provide the battle group commander with an immediately available tactical nuclear capability. Besides these items, the battle group can expect to receive from higher echelons additional means of fire support, mobility

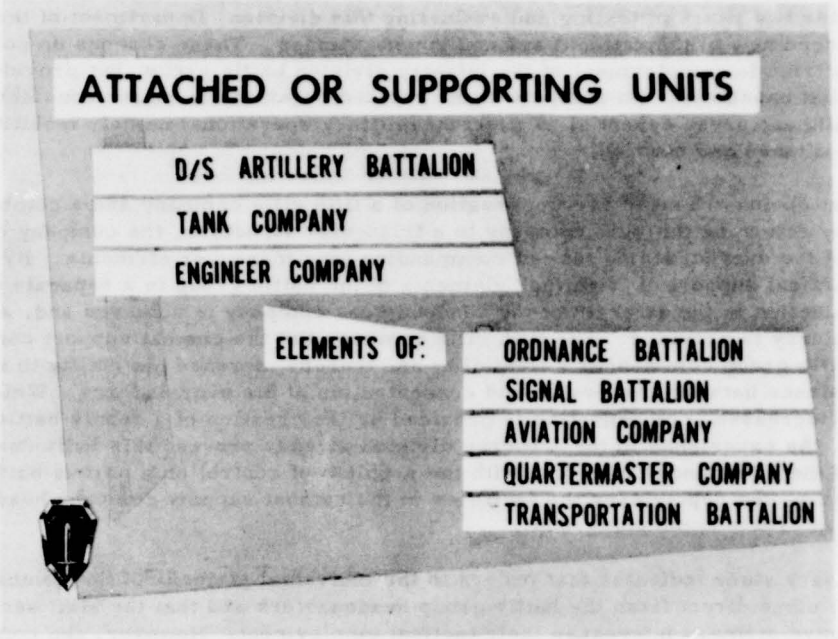

Figure 1. Attached or Supporting Units.

and armor when required (Figure 1). When attachments such as indicated here are made, logistical support from division must be increased accordingly. For example, when tanks or personnel carriers are attached, a proportional share of the organic support elements from the parent unit must be provided.

DEFENSIVE OPERATIONS

The mission of the Infantry is unchanged--to close with and destroy the enemy. This mission applies whether on offense or defense. In the defense we strive for dispersion, flexibility, retention of the initiative and maximum use of offensive action No longer is Infantry tied to the retention of ground in a static position; instead, Infantry skillfully uses terrain to help destroy the attacking enemy. The commander must dispose his force in such a manner as to make the enemy mass into locatable and lucrative targets, but he cannot afford dispositions which will provide the enemy an equal advantage. To gain flexibility he must disperse both

laterally and in depth, and have relative mobility at least equal to that of the enemy. To cover the wide areas, there must be overlapping capabilities of surveillance and fire and the ability to control the actions of distant subordinates. The commander must be provided and must provide his subordinate units with the means to sustain semi-independent operations for at least limited periods.

In organizing his forces for the defense, the battle group commander is guided by a number of general principles, the first of which concerns employment of the assault weapon platoon. The assault weapons are employed well forward in the area of the frontline companies so as to take maximum advantage of the missile's range and to permit engagement of enemy armor as far forward of the battle area as possible. The missiles are usually used to cover the most likely avenues of armor approach. Mutual support between the squads of the platoon is desirable; however, when the number of tank approaches and the distance to be covered by the platoon does not permit mutual support, the squads may be employed singly.

When tanks are attached to the battle group in defense, the major portion of the tank company is usually retained in reserve in order to capitalize on its offensive capabilities while at the same time providing the battle group with antitank defense in depth. Nevertheless, tank platoons may be attached to forward rifle companies to thicken the antitank defenses or to cover armor approaches not covered by elements of the assault weapon platoon.

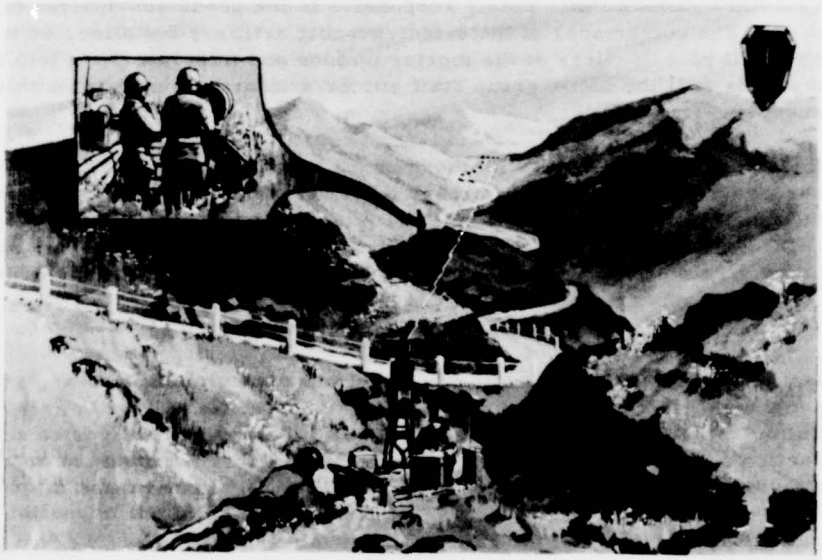

Figure 2. Radar Employment.

The reconnaissance platoon is initially employed under battle group control to maintain contact with units providing security forward of the battle group sector. Upon withdrawal of these security elements, the platoon may be used in one of several ways; in maintaining contact with flank units, in establishing observation posts, as an economy of force element, or in performing security missions in the rear portion of the battle group sector.

The radar section will be used in a combination of attached and general support roles. The battle group intelligence officer will exercise primary staff supervision over its employment. Normally, the short-range radars are employed well forward to take maximum advantage of their range and will usually be attached to the company in whose area they are operating. The medium-range radars will be employed under battle group control and positioned where they can best extend the coverage of the shorter-range devices and where they can provide surveillance in depth in the battle group sector (Figure 2). While the radars will, if properly employed, increase the commander's area of interest during hours of darkness or reduced visibility, it must be recognized that their ability to detect and locate enemy activity is dependent upon their employment from vantage points. Absence of suitable vantage points may seriously impair use of these devices since trees, brush and hill masks will clutter or block the radar signal to such an extent that no useful information can be obtained.

When a company (or more) of division engineers support the battle group, the organic engineer platoon may be directed to accept missions from the supporting unit commander. This ensures that engineer activities are closely coordinated. Engineer units are normally retained under battle group control. However, on extended frontages these units may be attached to reinforced company-size task forces.

The heavy mortar platoon will normally be employed in general support of the battle group with its fires and fire direction operations closely tied to those of the artillery battalion in direct support. However, the battle group commander may attach the platoon to a task force or otherwise use its elements separately if the situation warrants. But irrespective of how employed, the mortars remain immediately responsive to the needs and desires of the battle group commander. The commander of the direct support artillery battalion, as the fire support coordinator, will plan the fires of the mortar platoon and integrate them into the fire plan. The battle group S3 is still the battle group staff officer primarily concerned with the coordination of maneuver and fire support.

When the mortar fires are tied in with those of the howitzer battalion, the mortar and artillery forward observers will call for fire through their respective fire direction centers. When appropriate, the mortar platoon FDC may refer requests from his observers to the direct support battalion FDC and, conversely, the direct support battalion FDC may refer requests to the mortar platoon. This procedure enables the forward observers of either the direct support battalion or the heavy mortar platoon to adjust the fires of any mortar or artillery unit supporting the battle group.

With respect to fire support, defensive fires, both nuclear and nonnuclear, are planned to bring the enemy under increasingly heavy fire as he approaches the battle area. Fires are also planned within the battle area to limit penetrations and to support offensive action to complete the destruction of the enemy. Nuclear and nonnuclear fires complement and supplement each other and must be closely integrated to achieve maximum effectiveness.

Starting with the lowest level of the battle group's defensive posture, we find the squad retained as an integral unit disposed in two-man foxholes. The absence of internal communications in the squad, the fact that observers for supporting weapons are not normally present, and the fact that the squad is incapable of receiving and controlling major attachments all dictate limiting this unit to its present frontage--100 meters ($\pm$) (Figure 3).

Weapons organic to the squad are limited to direct fire at effective ranges of 460 meters. Infrared equipment, soon to be available, will permit surveillance at extended ranges. A squad, occupying well-prepared positions, is considered sufficient to cause an attacking force to mass at least a platoon in order to destroy the squad with conventional means. This massed platoon may well be a suitable target for improved nonnuclear weapons and under certain circumstances for subkiloton yield nuclear weapons as well.

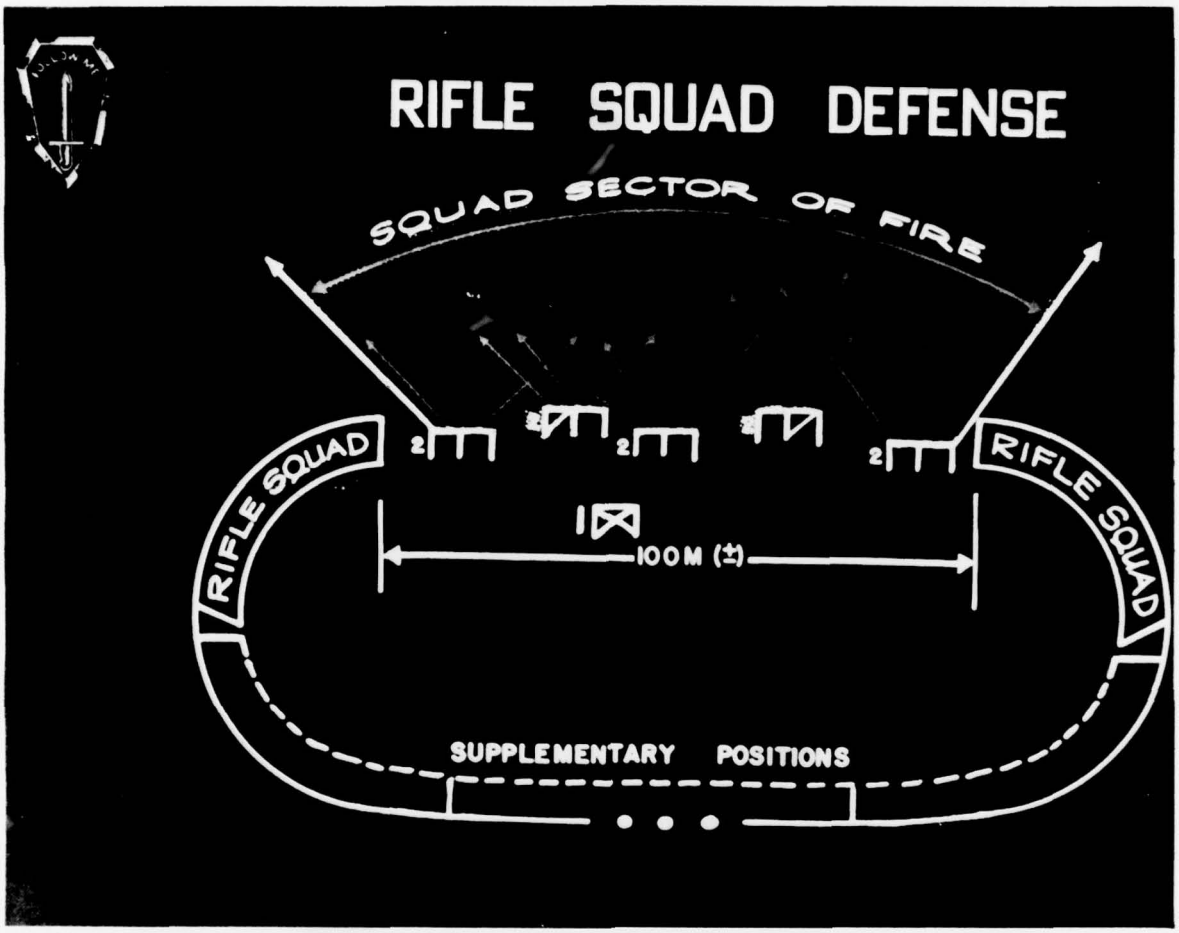

Figure 3. Rifle Squad Defense.

Shown here schematically is an optimum platoon disposition. The platoon frontage is achieved by adding to the distance the squads physically occupy--400 meters (±)--the width of the area the platoon can cover on each flank by fire--150 meters (±) (Figure 4). Coverage of this frontage is assured by the communications net, the ground surveillance equipment and the increased firepower available to the platoon. Under conditions of poor visibility, patrols and sensory devices are used to cover the gaps. Intra-platoon communications are particularly valuable in that, if the platoon position is penetrated or is threatened from the flanks or rear, they assist the platoon leader in moving men and weapons from the least engaged area into supplementary positions to meet this threat.

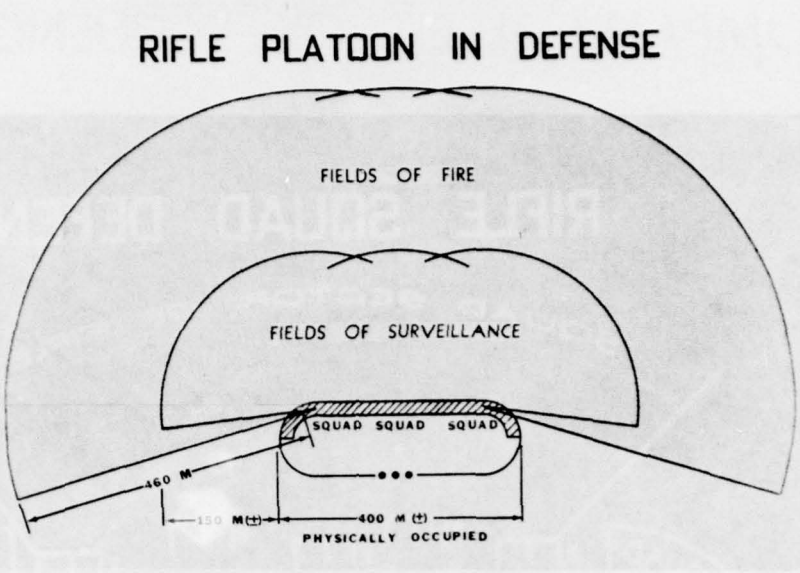

Figure 4. Platoon in Defense.

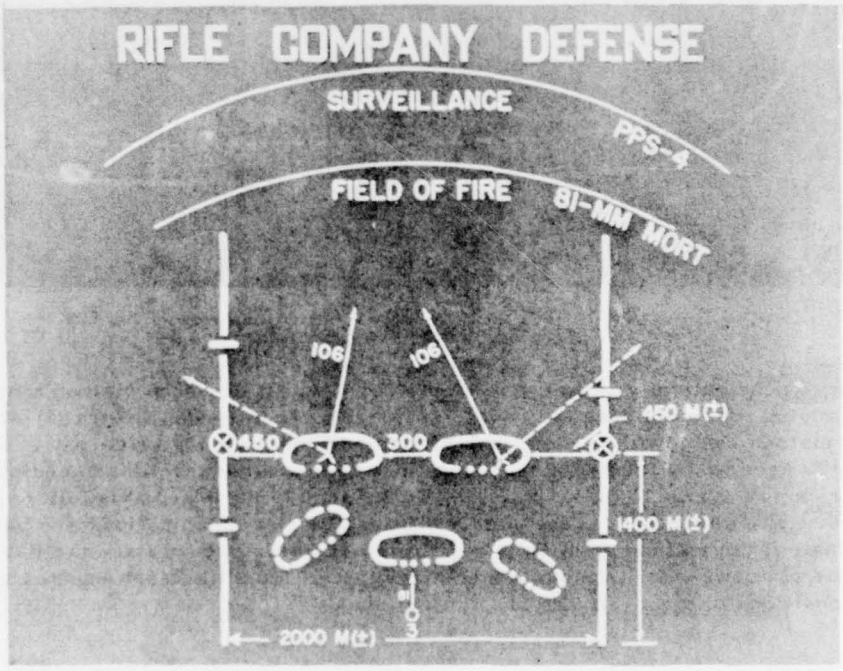

Figure 5. Company in Defense.

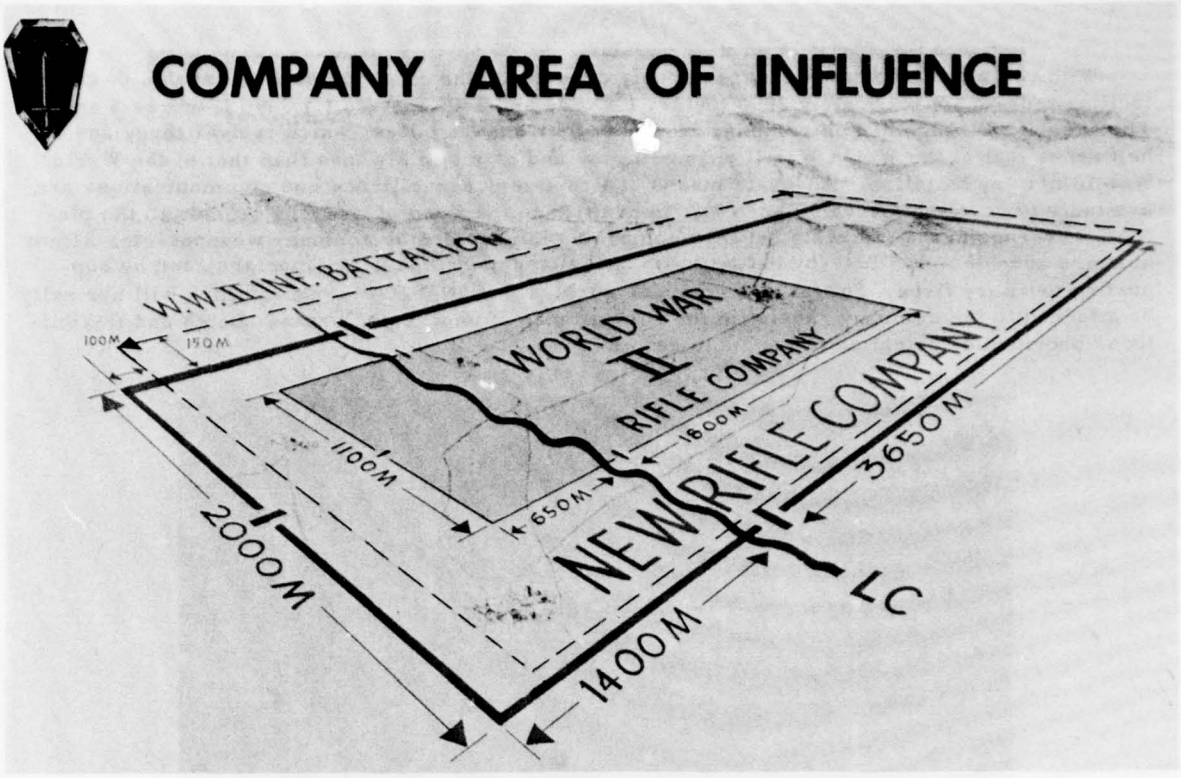

Figure 6. Company Area of Influence.

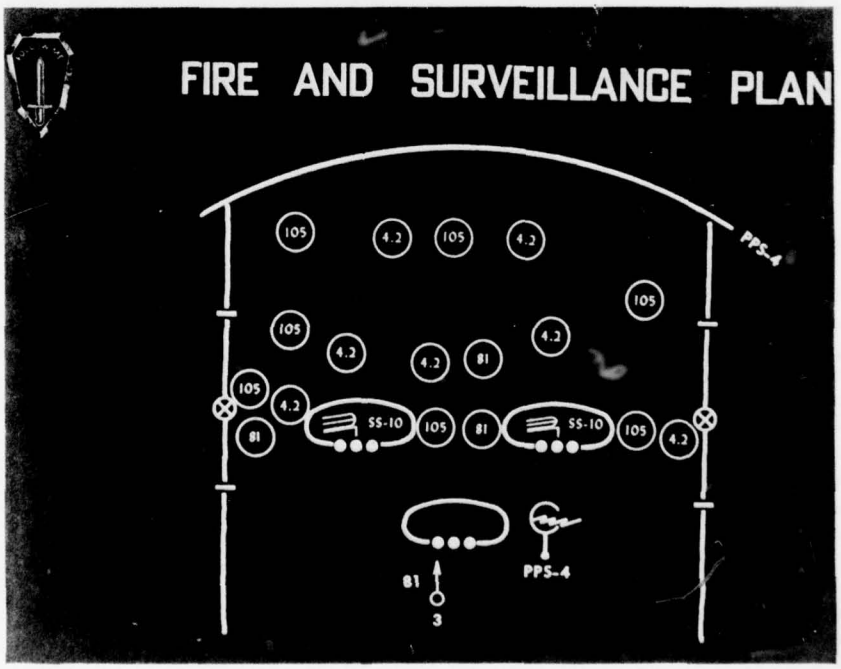

Figure 7. Fire and Surveillance Plan.

With two platoons deployed as previously described, the rifle company is capable of controlling terrain approximately 2000 meters (±) wide and 1400 meters (±) deep (Figures 5 and 6). The area of influence of this company is almost four square miles, which is over three and a half times that of the World War II rifle company and only slightly less than that of the World War II Infantry battalion. Adequate means of firepower, surveillance and communications are available to cover this area (Figure 7). In addition to the fires of weapons organic to the platoon, coverage of the intervals between companies is provided by company weapons--the 81mm mortars and 106mm rifles--by battle group assault weapons and heavy mortars, and by supporting artillery fires. Surveillance devices such as the AN/PPS-4, one of which will normally be attached to the company, assist in the surveillance of unoccupied areas. Depth and flexibility is provided by retention of a sizable reserve.

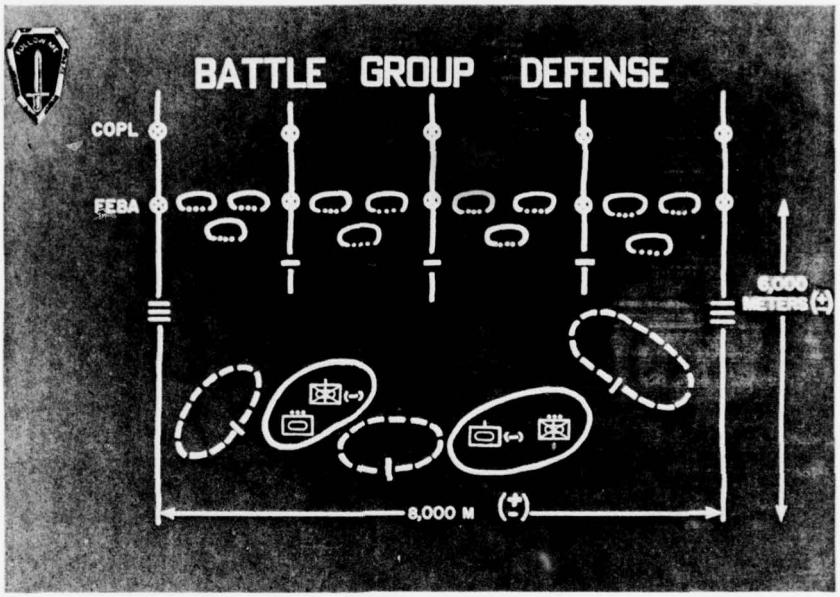

Figure 8. Battle Group Defense.

By accepting dispositions of the platoon and company as described, a battle group with an attached tank company can be expected to defend on a frontage of about 8000 meters (±) (Figure 8). Acceptance of this frontage is made possible by communications of greater range and reliability at company level, the addition of a platoon communications net, plus adequate means of surveillance and firepower. The companies are positioned astride likely avenues of approach and are strong enough to force the enemy to mass into suitable nuclear targets if he attempts to break through. The fifth rifle company and the attached tank company are retained in assembly areas as battle group reserve. Sufficient positions are prepared to permit these elements to adopt a blocking role if required. By cross-attaching platoons between the Infantry company, which is mechanized, and the tank company, the commander provides for two forces of approximately equal capability for offensive and defensive action. As the enemy closes with the forward companies, their security elements disposed to the front withdraw into the company's defensive position. At the same time, elements of the company engaged in rear area security and surveillance move forward to occupy their positions. Thus the company presents a cohesive defensive front. If the enemy pulls back, these elements will return to their original missions. This provides passive security from the enemy's use of nuclear weapons since

the company is dispersed over a large area when not in close contact, and if the enemy uses nuclears against the prepared company position when in close contact he will endanger his own forces.

In the defense, the deputy battle group commander may be used to command the COPL, reserve elements, a part of the FEBA, or rear area security forces in those situations which warrant organizing task forces for these missions.

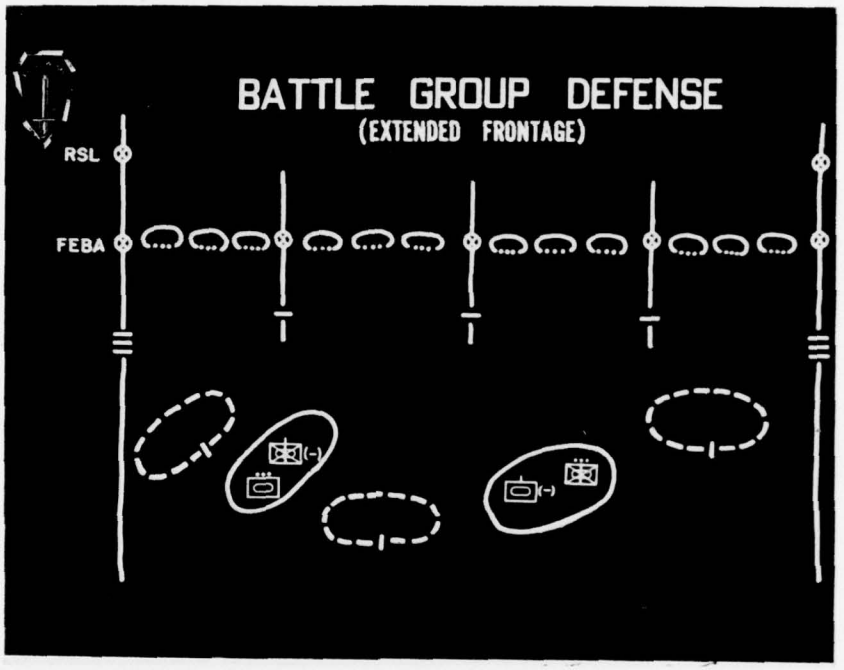

Figure 9. Battle Group Defense (Extended Frontage).

Under certain conditions the battle group may be required to defend on a much wider front (Figure 9). In this situation, the reserves at company level are, as illustrated here, the first to be sacrificed. Every effort is made to retain a highly mobile battle group reserve.

OFFENSIVE OPERATIONS

In order to successfully conduct offensive operations, the same tactical and logistical support from division mentioned earlier for the defense must, of course, be made available as required. In particular, to seize deep objectives, mobility in the form of personnel carriers and transport aircraft must be furnished.

A discussion of offensive operations logically begins with the rifle platoon, since it is considered the smallest unit which can be effectively employed in offensive action. It is the smallest unit with internal communications for adequate control; the smallest unit capable of developing a base of fire and a maneuver element. With the addition of greater firepower and intra-platoon communications, the squad has a stronger offensive capability than heretofore. More dispersed formations within the platoon may therefore be possible, since it will not be necessary to mass to the degree formerly required to deliver a heavy volume of fire in a specific area.

The platoon develops maximum combat power with its organic means on frontages of 460 meters or less. The communications organic to the platoon provide for communication at ranges up to one kilometer, while the weapons organic to the platoon are most effective at ranges up to 460 meters. It is estimated that a platoon can sustain itself for periods up to approximately 30 minutes without being subject to defeat. Based on this estimate, mechanized platoons may be separated at distances of 2250 meters and retain a satisfactory reinforcing capability. Platoons so separated are still within range of the organic company mortars, provided the mortars are located near the center of the company zone.

Accepting separation of platoons at distances of 2250 meters, the mechanized company is capable of attacking on frontages of up to 7500 meters (Figure 10). The limiting factor is the

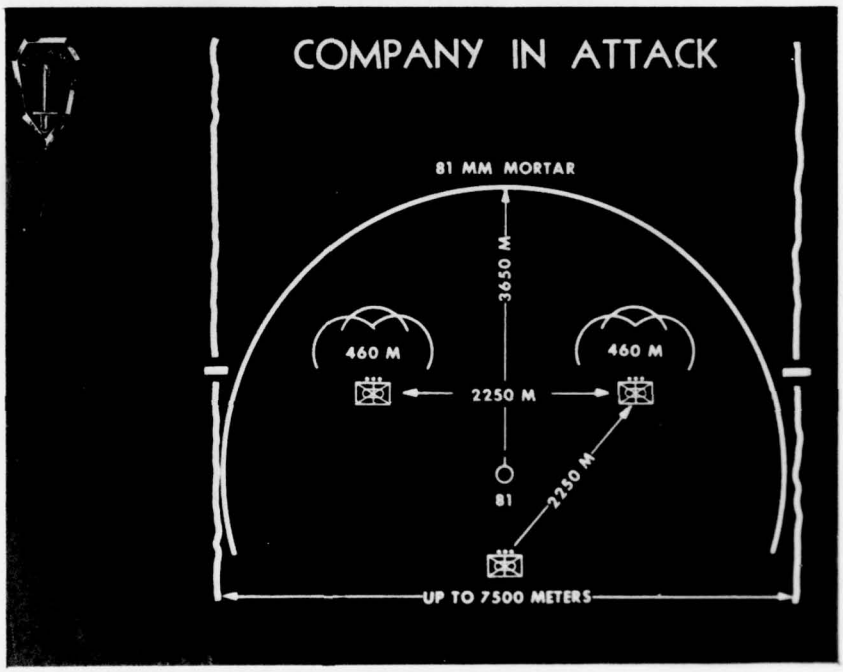

Figure 10. Company in Attack.

range of the 81mm mortar. Communications equipment in the company communications net provides for control at distances of from five to eight kilometers. The portion of the zone actually used will depend upon the mission, the enemy, terrain and combat power available. When adequate combat power in the form of fire support is available from higher echelons, emphasis is placed upon the seeking, locating, and determining of suitable targets by the attacking forces. In situations where such fire support is not available, concentration of elements of the company may become necessary in order to accomplish the mission. The same may be true when attacking in close terrain or when clearance of the zone is required. Disposing attacking elements over frontages as indicated here provides an excellent capability to develop nuclear targets and adequate dispersion to reduce vulnerability to enemy tactical nuclear weapons. On the other hand, the company is not so widely separated that it is unable to concentrate when required.

Accepting dispositions within the companies as described, under optimum conditions the battle group can reasonably be expected to conduct offensive operations on frontages up to the ranges of weapons under its control (Figure 11). This drawing shows the battle group attacking on such a frontage in two columns. It is anticipated that the leading company in each

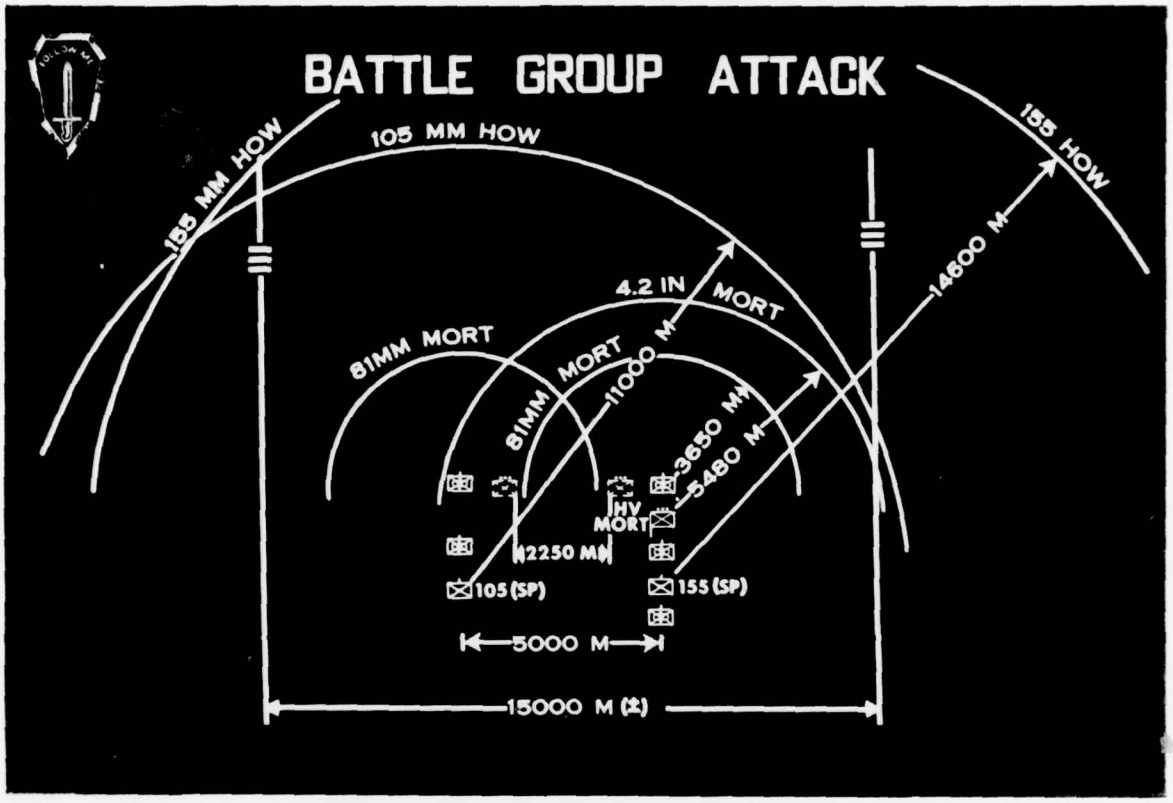

Figure 11. Battle Group Attack.

column will be disposed essentially as discussed previously, utilizing multiple routes to gain maximum flexibility. The heavy mortar platoon is positioned in the column making the main attack, and one of the two howitzer batteries of the direct support artillery battalion is placed in the other column. This provides nonnuclear support for all elements of the battle group. In addition, the companies are mutually supporting with 81mm mortars. Surveillance is provided by both surface and aerial means to ensure security of the advancing elements by screening the flanks and the area between the columns. The force in each column is sufficient to sustain itself for limited periods. In short, this formation provides for maximum flexibility, low nuclear vulnerability, and excellent capability to develop targets.

In establishing control measures over his attacking elements, the commander uses only those measures required to ensure that the operation proceeds in accordance with his plan. The size objective which can be assigned to a particular unit is dependent upon the ability of the unit to adequately control the objective once it has been seized. The depth of zones of action is dependent upon the ability of the unit to secure itself and keep lines of communication

open. If aerial lines of communication are used, then the depth is limited only by the requirement to remain within reinforcing distance. This will vary at each echelon according to the unit's capability for sustained independent action. Once the objective has been seized, only sufficient forces will remain to control the area and ensure its retention against ground or airborne attack. The remaining forces will move rapidly beyond to provide security and effect maximum dispersion of the command. This tactic will also tend to deceive the enemy by making him believe that the attack is continuing.

Let's examine more closely the employment of the battle group in a two-axis attack (Figure 12). Such a formation is indicated when the enemy situation is deteriorating, when relatively

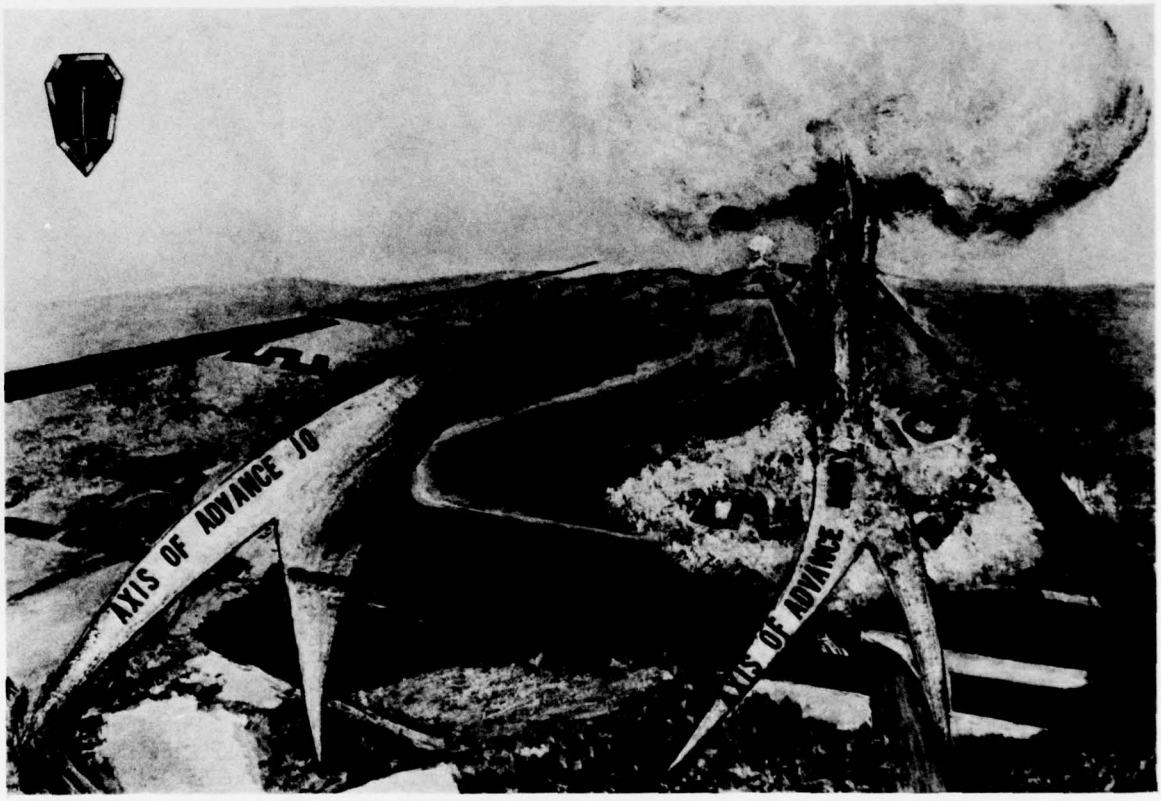

Figure 12. Axis Mary - Axis Jo.

detailed information of the enemy is available, when an adequate road net is present, when sufficient fire support is available, and when there is a need to keep pressure on the enemy. The selected axes cause the attacking units to converge on the dominating portions of the battle group objective. The axes are separated to the extent practicable, yet not so widely that the force on one is subject to defeat before the force on the other can move to its assistance. Each attacking company is assigned objectives within its capability. No intermediate objectives

are selected since their use may slow the operation and cause undue massing of forces. If, as the attack progresses, enemy resistance is such that it will delay the advance and interfere with accomplishment of the mission, then suitable intermediate objectives may be assigned.

In developing the plan of fire support, the commander provides for both nuclear and nonnuclear preparatory fires. Scheduled nuclear weapons are planned for use on located enemy positions which will be encountered early by attacking forces and on enemy reserves which may be able to reinforce forward enemy positions. Nonnuclear fires are closely integrated with the nuclear fires and are scheduled after detonation of the nuclear weapons. On call fires are also planned on known or suspected targets.

After breaking through the forward enemy positions, attacking companies move rapidly along their selected approaches under the protection of organic and supporting fires. Supporting weapons displace by echelon in such a manner as to provide close and continuous support or, if the situation allows, to move on-carrier until needed. The attack is characterized by a series of rapid advances and assaults closely supported by fire. As the attack progresses, combat power is shifted to the locality offering the greatest possibility of success.

When determined enemy resistance is encountered, the leading elements take aggressive action to overcome it--initially by the delivery of fires and then, if necessary, by maneuver. If the enemy cannot be eliminated quickly by the leading elements, the battle group commander takes immediate action to bypass the resistance with the remainder of his force, leaving the element in contact to eliminate or contain the enemy. If bypassing the resistance will jeopardize accomplishment of the mission, the commander commits additional maneuver forces to defeat the enemy (Figure 13).

To facilitate the rapid commitment of maneuver elements to action, the battle group commander forms his organic and attached units into combined arms teams.

By making full use of all the control headquarters available to the battle group (a total of six including a tank company) and by providing two of the six headquarters with both Infantry and tanks, the battle group commander achieves maximum flexibility in the conduct of the attack. Because of the deteriorating resistance and excellent approaches, tank heavy units could be advantageously employed on both axes; however, there are insufficient tanks available for this purpose. The tank company, less one platoon, forms the nucleus for a tank heavy team to make the main attack on axis MARY, the best approach into the battle group objective. This company is also assigned the objective which is expected to achieve the most decisive results. The main attack is also weighted with priority of fire support. Company A on axis JO is provided with a platoon of tanks to increase its combat capability. Company C, the second company in column on axis MARY, attaches one rifle platoon to the tank company.

To ensure adequate fire support, to reduce the length of the columns and to reduce vulnerability to enemy use of nuclear weapons, the fire support elements are split and retained in general support under centralized control. Because of the need to provide the secondary attack with a responsive means of fire support comparable to that furnished the main attack with the heavy mortars, the 105mm howitzer battery marches on axis JO.

Assault weapons have been furnished the force on each axis to provide antitank protection in depth. Assault weapon squads are attached to those elements on axis JO which are responsible for security missions. The assault weapon platoon (less three squads) is retained in general support and marches on axis MARY.

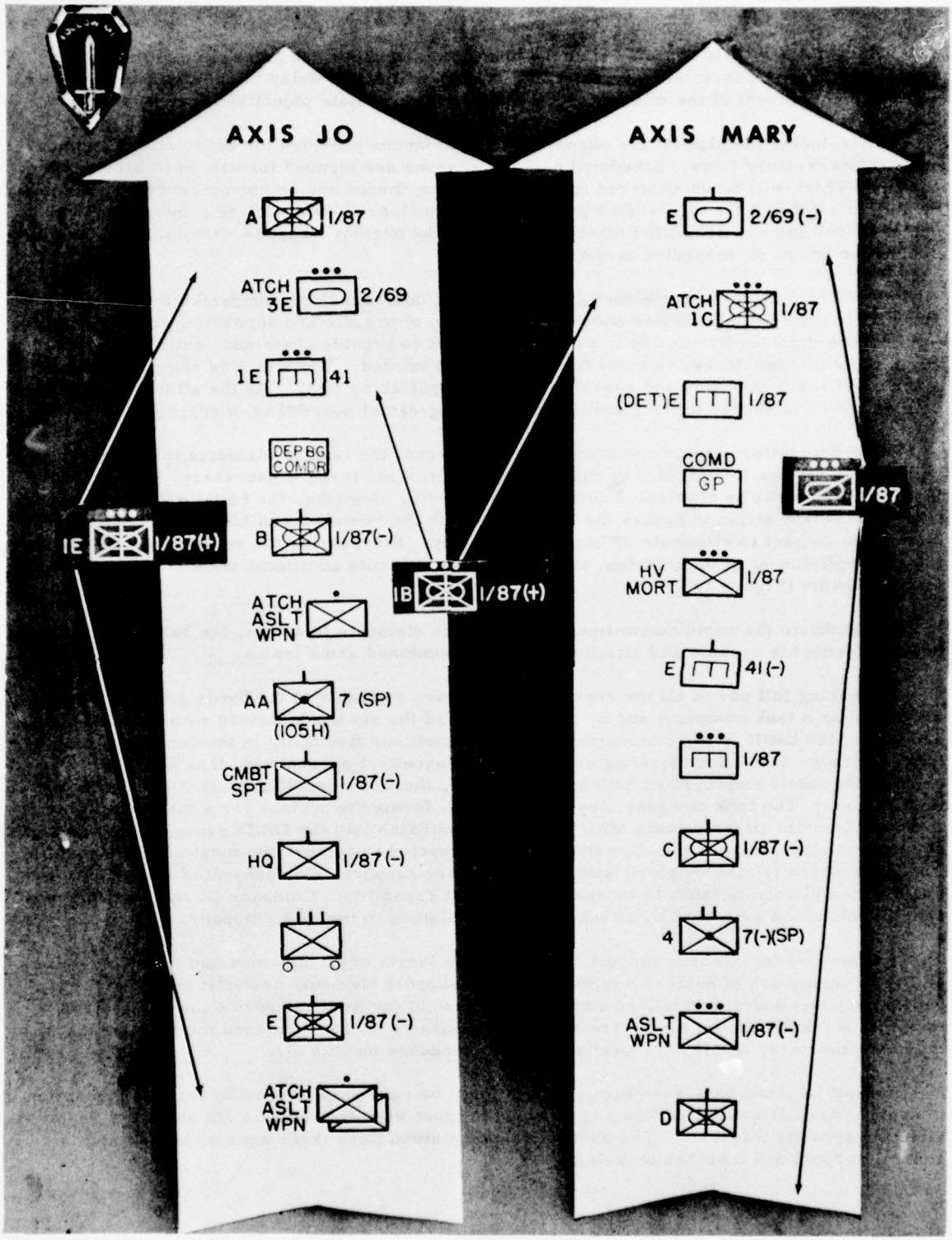

Figure 13. Organization for Combat.

The battle group commander's command group marches well forward on axis MARY where it can best influence the action of the main attack. Included in this group are the S2, S3, FSC and necessary signal personnel. The deputy battle group commander moves on axis JO. He uses the facilities of the combat support company headquarters to form the nucleus of an alternate command group which may include the battle group assistant staff officers. This group provides a duplicate command structure in the event that the major command element is destroyed or is unable to control the entire operation. Although battle group trains are shown with the force on axis JO, elements of the trains will move on both axes as required to provide the necessary logistical support. The battle group executive officer, S1, and S4 may be found with headquarters company (-), where they can effectively supervise and coordinate the battle group administrative support system. In an emergency, this group can also control the force on one of the axes or any part of that force.

The reconnaissance platoon screens the right flank of the battle group and Company E on axis JO screens the left flank with a reinforced rifle platoon. Company B on axis JO is responsible for screening the area between the axes and maintaining contact with the forces on axis MARY. This leaves the leading elements free to focus their attention upon the seizure of the assigned objectives.

Engineers are placed on each axis with the bulk of the engineers marching on axis MARY to support the main attack. Engineer reconnaissance detachments march well forward in each column.

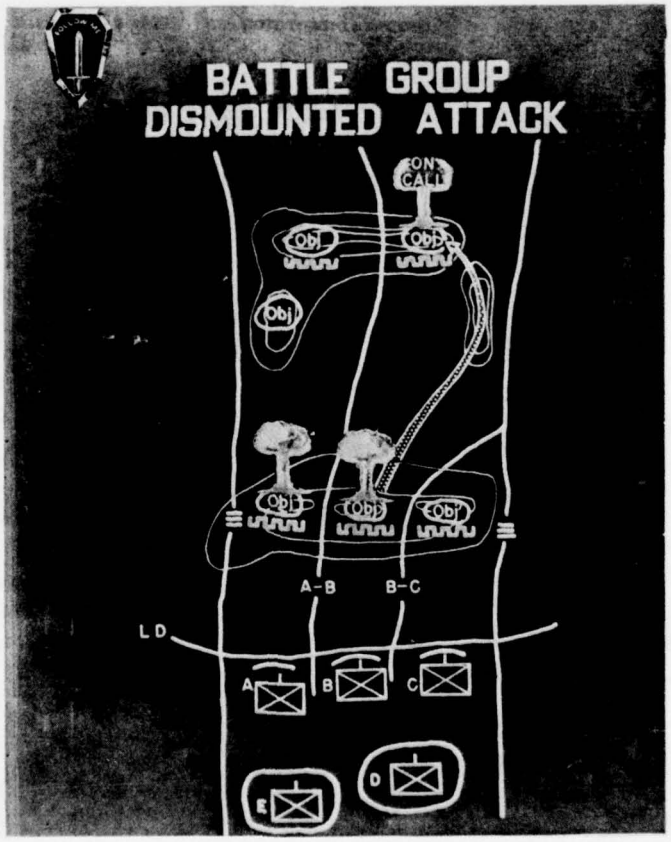

Figure 14. Battle Group Dismounted Attack.

In addition, attached elements of the division aviation company are employed as an additional means of security, to assist in command and control, for resupply, and to assist in medical evacuation.

The emphasis placed on mechanized operations in the offense should not be taken to mean that the dismounted attack is a thing of the past (Figure 14). There is still a requirement for dismounted operations--particularly against well organized positions. As illustrated here, the dismounted battle group frequently attacks with three or more companies in the attacking echelon. The size of the reserve is considerable; and, in addition, the possibility of finding and exploiting weak spots, which detonation of the nuclear weapons should create, is increased by attacking with a high degree of combat power forward. While plans for the battle group under nonnuclear warfare called for an attack on a narrower front with a heavy concentration of force in the zone of the main effort, the use of nuclear weapons permits a sizable reduction in the depth and a corresponding increase in the width of the attack formation.

TASK FORCE OPERATIONS

Faced with the necessity of conducting extremely fluid operations on a widely dispersed battlefield and of seizing deep objectives, the battle group commander will turn increasingly

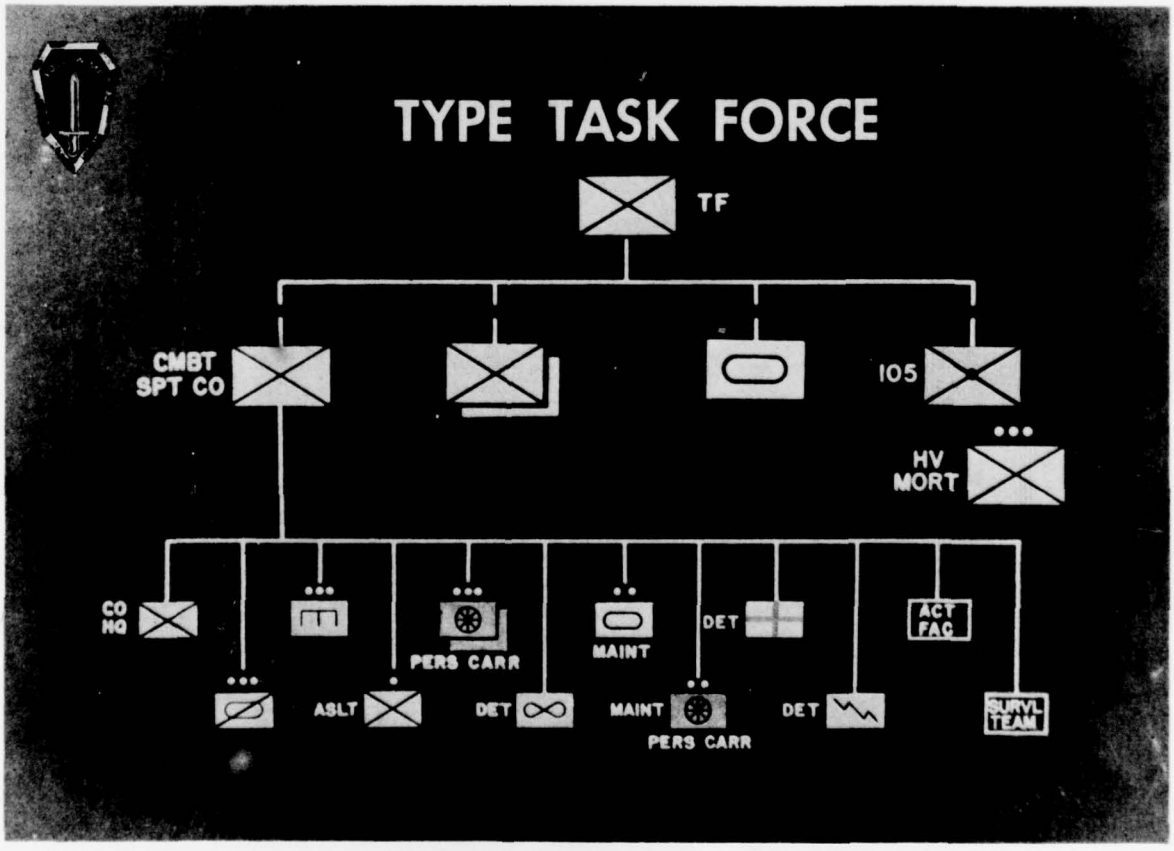

Figure 15. Type Task Force.

to the use of task forces. With the communications and firepower available now and in the near future, task forces can, with the exception of personnel carriers, be readily organized from elements of the battle group (Figure 15). Such task groupings will be formidable forces when equipped with assault weapons, aircraft, surveillance equipment and carriers. When reinforced with tanks and divisional artillery and necessary service support elements, they will have the capability of conducting semi-independent operations over a considerable period of time.

Upon receiving his mission, the commander of a task force organizes his units into reinforced company task forces. The number and composition of the forces may be changed throughout the operation; however, the tactical integrity of elements is maintained when possible.

The task force commander capitalizes on the mobility, firepower, and flexibility of his force to defeat enemy elements. Actions of the force are characterized by rapidity of movement, aggressiveness, maximum use of the offensive, maximum use of maneuver, and teamwork within the force.

BRIGADE OPERATIONS

At division, the brigade headquarters and staff perform many of the functions that may be assigned the deputy battle group commander when he is provided with a headquarters and staff. The brigade headquarters, which is integrated into the area communications system, normally operates in one echelon and far enough from division headquarters to preclude destruction of both headquarters by a single nuclear weapon. The brigade is prepared to assume the functions of the division headquarters, to command or supervise operations of subordinate and attached units of the division, or to accomplish other missions assigned by the division commander (Figure 16). The brigade headquarters is organized on an austere basis to provide representation of elements of the division headquarters and includes only a deputy, an executive, an S1,

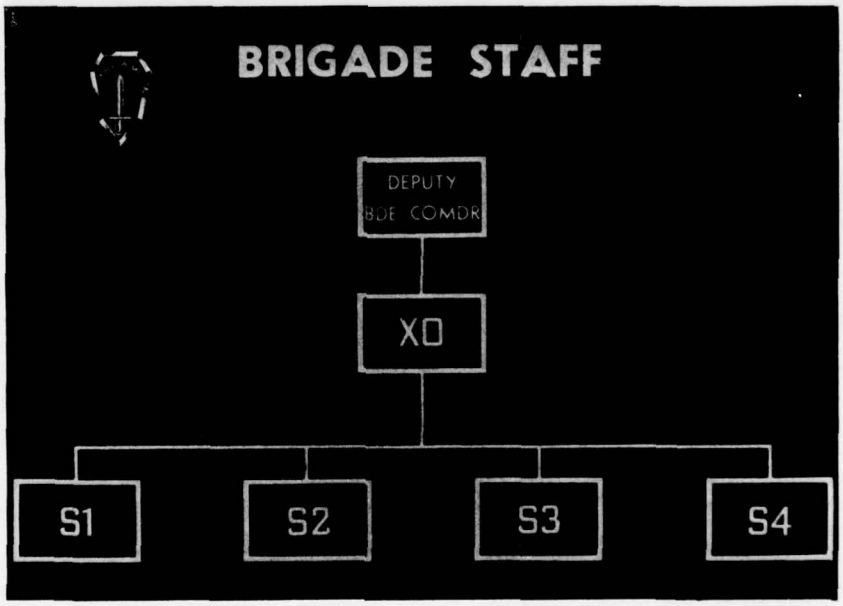

Figure 16. Brigade Staff.

S2, S3 and S4. Although the brigade is capable of taking over all command functions of the division in an emergency for a short time, for sustained operations it must be augmented with special staff officers. In this event, "across-the-board" representation of the special staff is desirable.

When the brigade is assigned a specific mission, tactical units are attached to it and communications augmented according to the needs of the situation (Figure 17). The normally independent type mission that will be assigned requires a combined arms and services type organization. To enhance their mobility, the Infantry elements normally require wheeled, tracked or aerial vehicles.

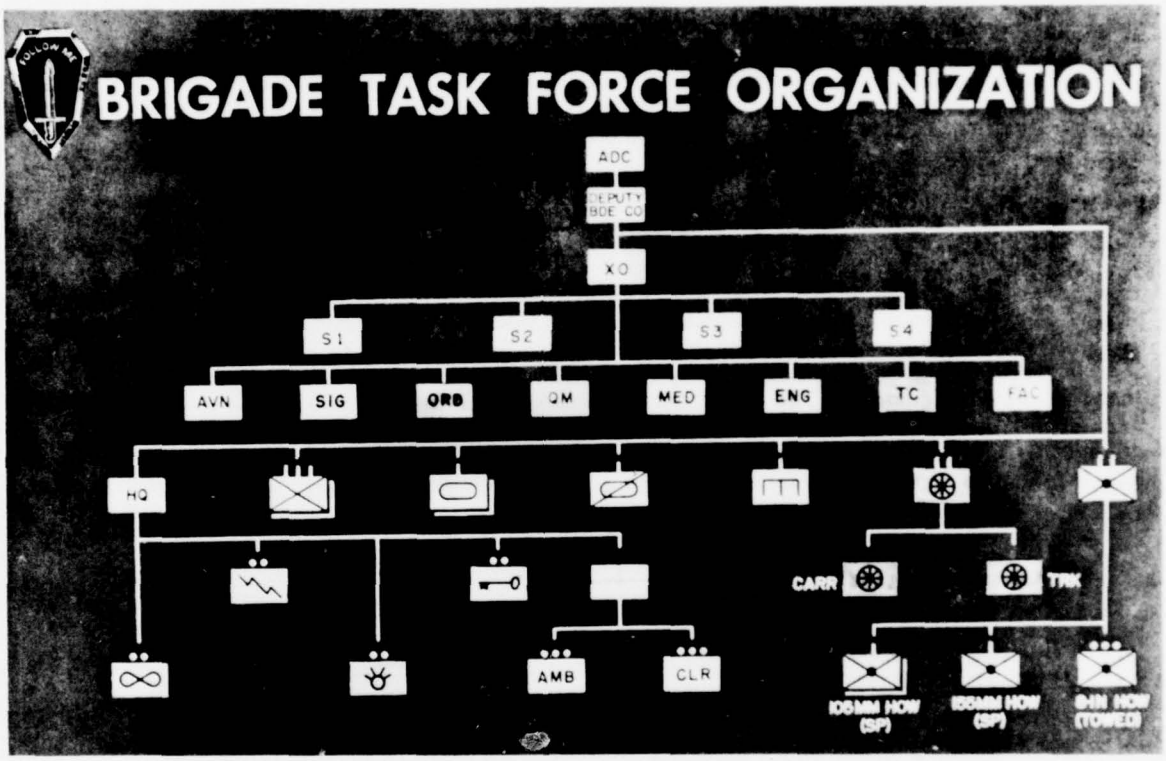

Figure 17. Brigade Task Force Organization.

Operations conducted by the brigade are similar to those conducted by the battle group, although on a larger scale. In the defense, the brigade may be employed in a number of different ways: to command the GOPL or RSL, to command battle groups on the FEBA, to command the division striking force, or to operate a planning headquarters. The most probable employment initially will be as a planning headquarters to plan division counterattacks (Figure 18). When counterattacks are conducted, brigade headquarters may, as illustrated here, be placed in command. Along with the mission of counterattack planning may go the task of supervising rear area security and/or preparing and occupying a position in depth in preparation for a retrograde movement.

In the offense, the brigade may be employed to command the covering force in an advance to contact, to command units on the secondary axis of advance, to command an exploitation force in a breakthrough, or, as illustrated here, to command an airlanded force (Figure 19).

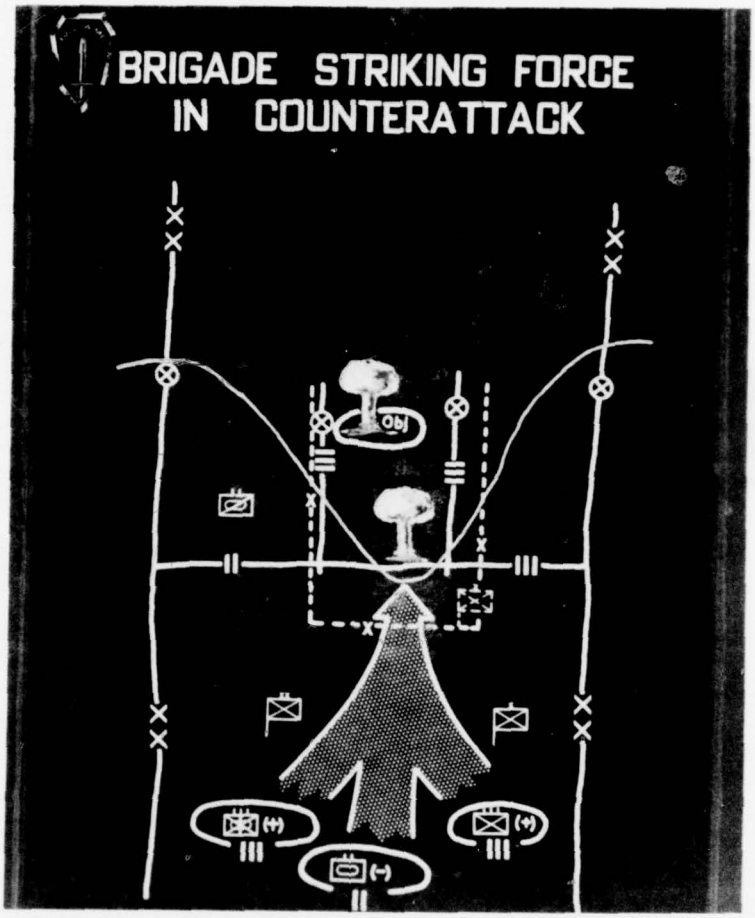

Figure 18. Brigade Striking Force in Counterattack.

Figure 19. Air-Landed Force.

CONCLUSION

Infantry's versatility is increasing. Its area of influence on the battlefield is expanding. As an organization, the battle group today has great internal flexibility in the formation of subgroupings around rifle companies; and it can, with more facility than ever before, detach elements or accept attachments of direct fire weapon groupings to accomplish missions abnormal to its day-to-day employment.

The challenge Infantry faces, if it is to continue to progress with the other arms in the development of the art of land warfare, is a great one and the success with which it is met depends in large measure on Infantrymen being alert and forward-looking. We are living in a dynamic era and must, therefore, continuously examine our tactical concepts to ensure progress in the field of doctrine. Doctrinal advances must precede technological progress for, in the words of the Army Chief of Staff, "the lead-time for understanding and acceptance of new ideas can often be a far greater problem than that for the production of the complex new hardware required to realize a concept."

Section IV. LOGISTICAL ORGANIZATION OF THE INFANTRY DIVISION AND THE BATTLE GROUP

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Improved mobility and nuclear firepower, while improving the combat capabilities of the Infantry battle group, have complicated the problem of logistical support. Rapid movement and dispersion on the battlefield plus the need for improved security of supply lines and logistical installations have created a requirement for a very flexible and responsive logistical organization.

Logistics encompasses five specific operations: supply, evacuation and hospitalization, transportation, service and management.

The division commander has overall responsibility for logistical support of the division. The G4 is a general staff officer who coordinates the operations of logistics. He is responsible for the planning and supervision of logistical training of his own section and, in coordination with the G3, for such training within the command. The G4's specific duties include making logistical estimates and plans, preparation of orders, disseminating information and coordination and supervision of all the functions of logistics.

Estimates, plans, recommendations, coordination and supervision of specialized logistical functions are provided by the division special staff officers. The special staff is commanded directly by the division commander and its functions are coordinated by the general staff. Special staff officers having logistical functions either command or have operational control of the division technical service units. All seven technical services are represented in the Infantry division (Figure 1).

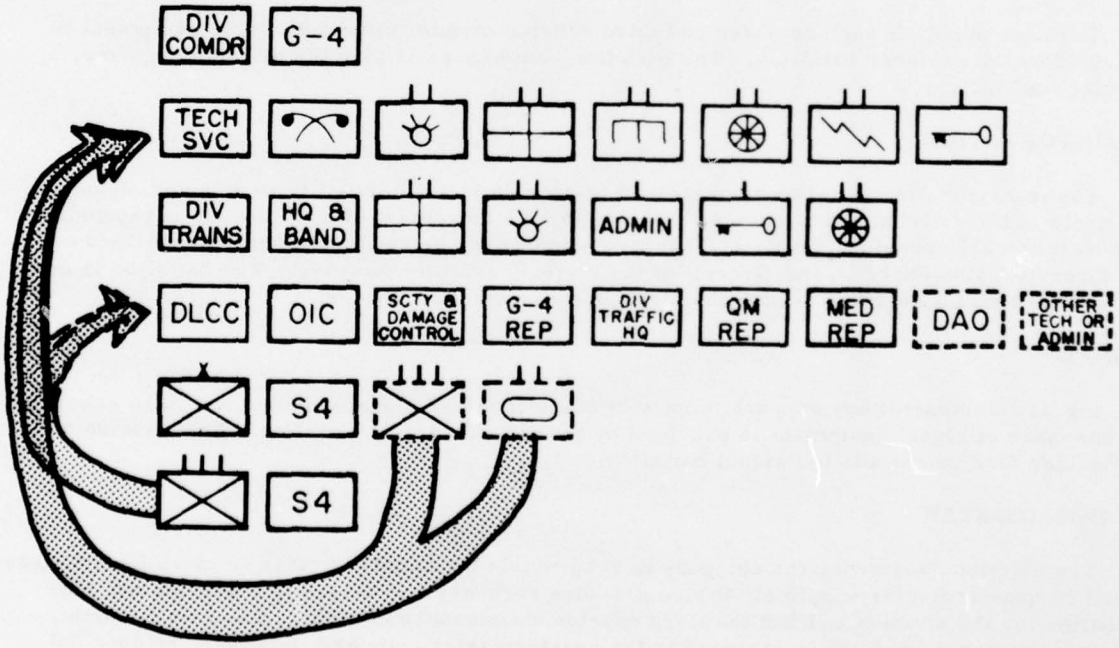

Figure 1. Logistical Organization, Infantry Division.

CHEMICAL

The chemical and radiological center, organic to the headquarters and headquarters company Infantry division, is under the control of the division chemical officer, a Lt Colonel. The center provides radiological survey and advises on the employment of chemical munitions in coordination with the G2 and G3 respectively. The assistant division chemical officer, assisted by a supply sergeant and two chemical equipment repairmen, receive, edit and consolidate requisitions for class II and class IV chemical supplies. In addition, they perform limited third echelon maintenance on Chemical Corps equipment within the division. This maintenance capability is augmented by the attachment of a platoon from the chemical support company (Corps Troop List).

ORDNANCE

Ordnance supply, except ammunition, and third echelon maintenance of ordnance wheel and track vehicles, artillery, small arms and instruments, is provided by the ordnance battalion. Although the battalion does not provide class V supply it does execute administrative control of ammunition supply through the division ammunition officer. The battalion is commanded by a Lt Colonel who is also the division ordnance officer.

MEDICAL

Evacuation of wounded and injured from unit aid stations, sorting and emergency medical treatment, preparation of patients for evacuation from the division area and supply of class II and IV medical equipment is provided by the division medical battalion. The division surgeon is assigned to the medical battalion; however, he does not command the battalion, but functions only as a special staff officer.

ENGINEER

Engineer supply to include water and third echelon maintenance of engineer equipment is provided by the engineer battalion. The battalion commander is also the division engineer, a special staff officer.

TRANSPORTATION

The transportation battalion is organized to provide tactical mobility to selected maneuver elements of the division and to provide vehicles for the movement of supplies and personnel. The battalion also provides supply of Transportation Corps class II and IV items and third echelon aircraft maintenance on the aircraft of the division aviation company. The battalion is commanded by a Lt Colonel who is also the division transportation officer.

SIGNAL

Signal communications support, supply of class II and IV signal supplies and third echelon maintenance of signal equipment is provided by the division signal battalion. The division signal officer also commands the signal battalion.

QUARTERMASTER

The division quartermaster company is responsible for supply of class I, class III and class II and IV quartermaster supplies. It also provides recovery and disposition service and bath facilities for the division and limited third echelon maintenance of quartermaster equipment. The division quartermaster is assigned to the quartermaster company, however, he does not command the company.

DIVISION TRAINS

Division technical services, which are primarily logistical in nature, are assigned to the division trains. The division trains are commanded by the trains commander, a Colonel, who is a tactical commander. He tactically commands units in the trains area and is responsible for movement, protection and security of service units, and tactical training of service units. The trains commander facilitates accomplishment of technical operations by close coordination with service unit commanders and staff officers but is not responsible for administrative and technical operations of the service units. Because the mission of the chemical, engineer and signal elements is primarily operational, they are not included in the division trains.

Trains headquarters, organic to headquarters and headquarters detachment, and the band provide the commander with an executive officer and an S1, S2, S3 for tactical control of the Infantry division trains. Mess, administrative and supply personnel are organic to the detachment headquarters. The band, in addition to playing music, is utilized to perform security missions within the division trains. The division trains are organized as follows (Figure 2).

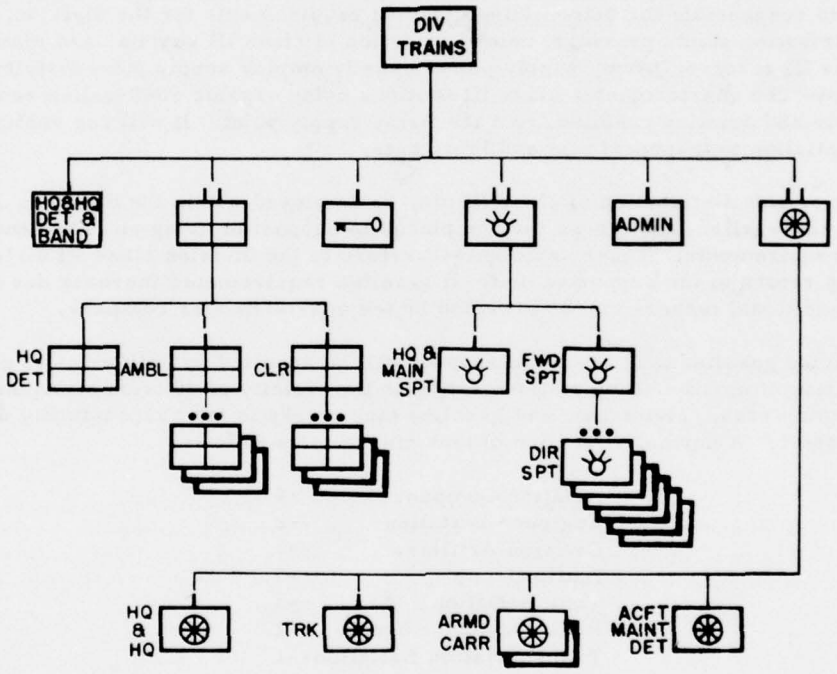

Figure 2. Infantry Division Trains.

QUARTERMASTER COMPANY

The quartermaster company consists of a supply platoon, a bath section and a memorial activities platoon.

The supply platoon is organized into a class I section, class II and IV section and a class III section.

The class I section requisitions rations from Army based upon requests submitted from units of the division. Army normally delivers rations from Army supply points to the division class I distributing point. Personnel of the class I section break down the rations and normally execute unit distribution to units of the division. Approximately fifteen 2 1/2-ton trucks, organic to the division transportation battalion, are required on a daily basis to distribute class I supplies. The transportation battalion also provides twenty-seven 1 1/2-ton cargo trailers to haul one reserve ration (when authorized).

The class II and IV section requisitions supplies from Army based upon requests submitted from battle groups and separate units. Army normally will deliver the supplies to the class II and IV section. There the supplies will be broken down for unit or supply point distribution. Frequently, unit distribution is employed by shipping class II and IV supplies to units of the division on class I vehicles or on additional vehicles provided by the transportation battalion. The section is capable of limited packaging of supplies for aerial delivery by Army aircraft and provides limited second and third echelon maintenance on quartermaster supplies.

The class III section is equipped with thirty 1200-gallon tank trucks and five 5000-gallon tank trucks. It is responsible for determining class III requirements for the division, operating the class III distributing point, providing unit distribution of class III supplies and maintaining the division class III reserve. Army supply points usually employ supply point distribution for class III supplies. The quartermaster class III sections using organic 5000-gallon semitrailers will pick up motor and aviation gasoline from the Army supply point. It will use vehicles of the transportation battalion to transport oils and lubricants.

Supply point or unit distribution of class III may be employed within the division. Approximately eighteen 1200-gallon tank trucks may be placed in support of using units to handle their minimum daily requirements. These vehicles will return to the division class III distributing point, reload and return to the supported unit. If gasoline requirements increase due to the tactical situation, additional tankers can be provided by the quartermaster company.

Units not having gasoline tank trucks in support will be supplied by deliveries of gasoline to unit areas or by use of mobile filling stations set up in the vicinity of division headquarters and in the division trains area. Maintenance of gasoline tank trucks is the responsibility of the division quartermaster. A normal allocation of tank trucks is as follows:

Aviation Company	--4
Engineer Battalion	--2
Division Artillery	--2
Battle Group	--5
Tank Battalion	--3
Reconnaissance Squad	--1
Transportation Battalion	--1

The bath section is capable of operating six 24-head shower units with a total capacity of 10,500 showers per day. Shower points are located within the division area where they can best serve the units of the division.

The memorials activities platoon (augmentation authorized by Department of the Army) is responsible for limited recovery and disposition service to include receipt, initial identification and evacuation of the dead. It operates the division recovery and disposition collecting point.

Five of the six collecting and evacuation sections will normally be employed in support of the five battle groups and one is employed in support of a task force or where required in the division.

ORDNANCE BATTALION

The battalion headquarters and the main support company are normally located together in the division service area. The headquarters provides command, administrative (not second echelon personnel actions), technical and operational supervision of organic battalion elements and attachments. Also included in the headquarters is the division ammunition office which provides administrative control of ammunition supply to units of the division and attachments. This office may be located with the ordnance battalion headquarters or near the Army class V supply point.

The main support company provides third echelon maintenance and direct exchange ordnance support to units located in the division service area; ordnance class II and IV (other than direct exchange) supply support for units of the division; reinforcing third echelon maintenance and general supply support to the forward support company; limited evacuation support of vehicles to supported units; and operates the division ordnance collecting point.

The forward support company is located where elements of the company can best provide ordnance support for forward units of the division. The company provides third echelon maintenance and direct exchange ordnance support for forward units of the division. The company provides third echelon maintenance and direct exchange ordnance support for forward division units; 6 direct support ordnance platoons which are habitually assigned to support the same battle group and the cavalry squadron; a maintenance platoon for support of all other units in the forward area; limited evacuation support and assistance in battlefield recovery; and appropriate elements may be tailored to accompany separate task forces to assure prompt repair or recovery of ordnance equipment.

MEDICAL BATTALION

The headquarters and headquarters detachment provides command, administration and organizational maintenance for the battalion, personnel for the division surgeon's office, and medical supply for the division.

The ambulance company, which is organized with a company headquarters and three ambulance platoons, evacuates casualties from the battle group aid stations, assists in the evacuation of casualties from the aid stations of the armor, artillery and engineer battalions and the cavalry squadron, and provides ambulance support for units of the division not having organic ambulances. Ambulance platoons are associated closely with the clearing elements and evacuate casualties from combat and combat support units to the clearing station or, in an emergency, to the field hospital supporting the division. Normally, two ambulance platoons will be closely allied to the forward clearing stations. The third ambulance platoon will be used to reinforce forward ambulance elements, to assist the combat support battalions in evacuating their patients to the clearing station operating in the division trains area, or to support a separate task force.

The clearing company operates three clearing stations, each with a capacity of 80 patients; operates a central psychiatric treatment facility; provides emergency dental care; and provides mess facilities and supply service for the ambulance company.

The battle groups are supported on an area basis by the clearing platoons. Normally, two clearing stations will operate in area support of the combat elements and one platoon will be in support of the division trains. However, the third clearing platoon may be used in any of the following ways, providing area medical support for the division trains is assumed by the field army medical service:

1. To reinforce, replace, or leapfrog a clearing station in area support of combat elements.
2. To provide emergency aid stations for area damage control.
3. To support a separate task force.

TRANSPORTATION BATTALION

The mission of the transportation battalion is to provide tactical mobility to selected maneuver elements of the division, vehicle pool for movement of personnel and supplies, and third echelon aircraft maintenance. The headquarters and headquarters company, in addition to providing command control and administration for organic units, contains 1 truck maintenance section and 2 carrier maintenance sections. These sections perform organizational maintenance on the vehicles of the truck and carrier companies. Further, it is normal for a maintenance section to accompany a truck or carrier company when one is attached to a battle group.

The truck transport company is organized with four truck platoons, each having twenty 2 1/2-ton trucks and 1 1/2-ton cargo trailers. At full strength, based on 100 percent vehicle availability, the company can transport in one lift: 320 short tons of cargo or 1600 personnel or a combination thereof.

A requirement exists for permanent dispatch of the following vehicles:

2 1/2-ton trucks	1 1/2-ton trailers	Purpose
	16	Transportation and storage of class III reserve of packaged gasoline.
	27	One reserve ration, when authorized.
2	2	Oils and lubricants.
15		Class I distribution.

The carrier companies are organized with three carrier platoons and have the mission of providing protected tactical mobility capable of operating on roadways or cross-country and a means of resupply and evacuation of combat elements when routes are covered by enemy observed fire. Each carrier company has organic 57 carriers. Thirteen carriers are required to move the walking elements of a rifle company and provide a carrier for the company command group.

The aircraft maintenance detachment performs third echelon maintenance on the aircraft of the division and provides emergency supply to the division aviation company. Its supply capability is limited to 3 days of parts required for shop supply. The aircraft detachment is dependent upon the administration company for personnel administration and upon other units located in the vicinity of the maintenance airfield for mess.

ADMINISTRATION COMPANY

The administration company provides personnel and administrative services, including replacement support, to divisional units.

DIVISION LOGISTICS CONTROL CENTER

A method of coordinating logistical support within the division is through the employment of a division logistics control center (DLCC). The DLCC, as a minimum, will consist of the following: an officer in charge (normally the trains commander); a G4 representative; rear area security and rear area damage control element (normally from staff of division trains commander); division traffic headquarters; division ammunition office (when this will not require

back-tracking of supply vehicles); a quartermaster representative; and the necessary administrative and communications personnel. When the functions of the DLCC are expanded, the composition of the DLCC will be expanded and may include representatives from G1, G5, any of the technical services and army aviation.

The functions of the DLCC vary from one situation to another, but will, as a minimum, include: coordination and expediting of priority and emergency supply and service actions; rear area security and rear area damage control; functions of division traffic headquarters; and the compiling and dissemination of information. Type information normally compiled and disseminated by the DLCC includes:

1. Location of organic and attached elements of the division, with particular attention to their command and logistical installations.
2. Traffic plans for division, corps and adjacent units.
3. Route conditions.
4. Status of supply at division distributing points.
5. Vehicle availability data.
6. Location of Army supply points.
7. Status of Army aircraft assisting in the logistical support of the division when aircraft are under operational control of the division.

These functions may be expanded to include scheduling the consolidation and delivery of supplies from division supply and Army supply points; processing requests for aerial supply; coordination of medical evacuation, prisoner of war evacuation, recovery and disposition activities; administrative movement of personnel; and battlefield recovery and evacuation of damaged equipment.

BRIGADE LOGISTICAL SUPPORT

When the brigade is employed in semi-independent operations, the brigade S4 operates essentially the same as the S4 of the armored division combat command. He keeps the brigade commander and staff informed of the logistical situation within the brigade. He controls, coordinates, moves and provides security for the brigade trains. The brigade trains consist of the field trains of attached battle groups plus any division logistical elements attached to or in support of the brigade. The brigade S4 controls the movement and provides security for resupply convoys originating within the brigade. He maintains liaison with subordinate unit supply officers, keeping himself informed of their logistical situation and assisting them in logistical matters.

In defensive situations the brigade S4 normally will not have the field trains of subordinate units under his control. In this case, his duties involve liaison with subordinate unit supply officers and assisting them in logistical matters, plus advising the brigade commander and staff of the logistical situation. Units of the brigade requisition supplies directly from the technical services. The brigade S4 does not handle administrative material involved with resupply.

BATTLE GROUP LOGISTICAL SUPPORT

The battle group S4 has staff responsibility for the logistical support of the battle group. He operates at the battle group command post. He plans, coordinates and supervises the operations of logistics within the battle group. He is responsible to the battle group commander to ensure adequate support for the tactical plan. To accomplish this he follows the situation and keeps in close contact with other staff officers of the battle group, unit commanders and commanders of attached units, the division G4 and the division special staff.

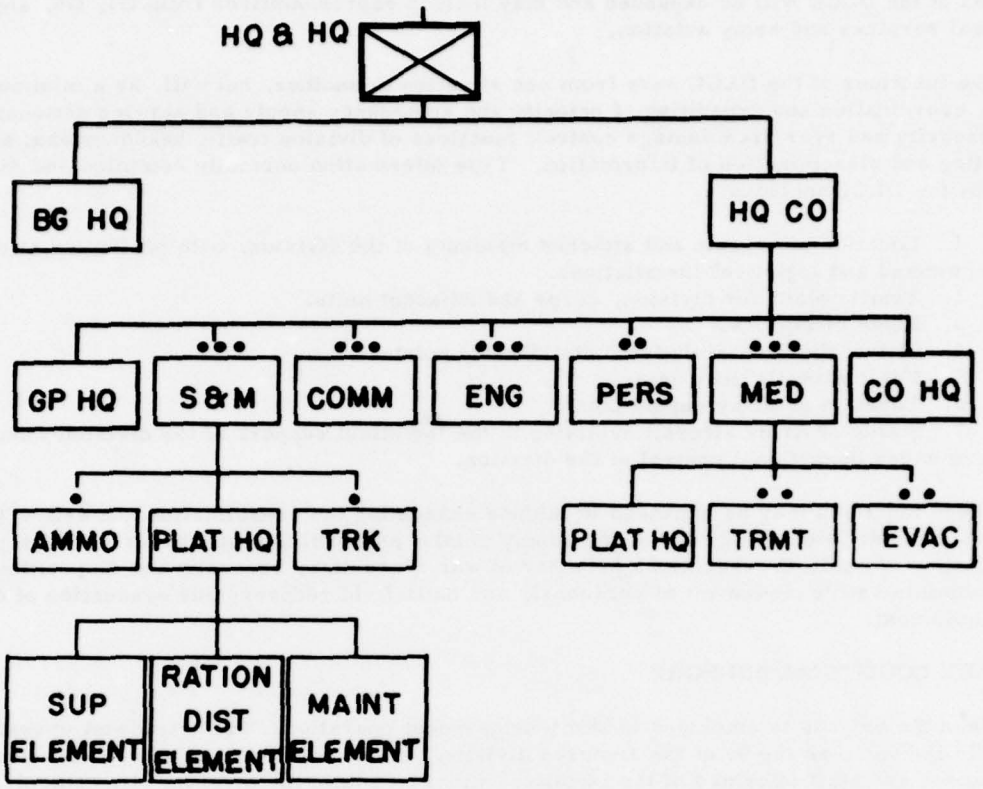

Figure 3. Headquarters and Headquarters Company, Infantry Division Battle Group.

The major portion of the battle group logistical support elements are found in the battle group headquarters and headquarters company. The supply and maintenance platoon consists of a platoon headquarters, an ammunition squad and a truck squad. This platoon is commanded by a Captain (MOS 4010) who is also the assistant supply officer (Figure 3).

Because the platoon headquarters is composed of personnel with varied capabilities and duties, it is divided into three elements for operational purposes. The supply element is supervised by the supply warrant officer; maintains all property accounting records for the battle group; prepares all formal supply requisitions, receives and distributes class II and IV supplies; operates the salvage collecting point; receives and distributes class III supplies; and acts as a logistical information center for the battle group.

The maintenance personnel, uder the immediate supervision of the maintenance warrant officer, form the maintenance element. This element performs second echelon maintenance on the vehicles of the battle group and effects repair parts supply on a direct exchange basis with the direct support ordnance platoon.

The third element, the ration distribution element, is composed of one man--the ration distribution sergeant. He is responsible for receipt, breakdown and distribution of class I supplies.

The ammunition squad is equipped with seven 5-ton vehicles, four 2 1/2-ton trucks, 7 water trailers and 4 cargo trailers. This squad establishes the battle group ammunition distributing point (ADP), distributes ammunition to units of the battle group, and effects resupply from Army class V supply points.

The truck squad, equipped with seven 2 1/2-ton trucks with 1 1/2-ton trailers, transports the impedimenta and field kitchens of the units of the battle group. When not employed in this manner, it is used for transporting personnel and supplies.

The capability of the supply and maintenance platoon's maintenance element is increased by the utilization of maintenance personnel assigned to the combat support company.

The medical platoon provides limited treatment and medical evacuation from the forward units of the battle group. The platoon is capable of establishing and operating two aid stations. The aid stations may be employed laterally to support a wide frontage or used in a leapfrog manner to expedite displacement. The evacuation section contains 14 frontline 1/4-ton ambulances which are employed to evacuate casualties from the forward companies to the battle group aid station(s).

The communication platoon, although under the staff supervision of the battle group S3, does provide a certain amount of logistical support. This platoon performs second echelon maintenance on the signal equipment of the battle group. It coordinates third echelon maintenance and executes a direct exchange of effective components with the battle group area support platoon, a unit of the forward communications company, division signal battalion, all of which habitually operate in support of the battle group.

The engineer platoon, also under the staff supervision of the battle group S3, provides limited engineer support to facilitate logistical functions. This platoon has as organic equipment the Infantry entrenching set which is utilized by elements of the battle group to prepare fortifications and other light engineer type construction.

To provide logistical support for the battle group and its attachments, combat and field trains are normally employed (Figure 4). Combat trains are those vehicles and accompanying personnel (or those functional trains or portions of the functional trains) required for the immediate support of the combat mission. Functional trains are vehicles and personnel grouped according to the function performed. The combat trains will consist of ammunition trains, fuel and lubricant trains, medical trains and maintenance trains. Combat trains are employed forward in the battle group area under the immediate control of the battle group motor officer.

The field trains of the battle group are those functional trains or portions of functional trains not required for immediate support of the combat mission. They do not accompany the combat units and are controlled by the assistant S4. The field trains are located usually 9-16 kilometers to the rear of the forward companies. The assistant S4 selects the exact location of the field trains and is responsible for security and movement of the field trains.

In addition to the functional trains indicated above, the field trains will have the kitchen and baggage trains of the battle group and its attachments. Other installations which make up the composition of the field trains include:

1. Class I distributing point.
2. Class III distributing point.
3. Class II and IV distributing point (when required).
4. Recovery and disposition collecting point (operated by the collection and evacuation section, division quartermaster company).
5. Salvage collection point.

6. Direct support ordnance platoon (attached or in support from the forward support ordnance company).

7. Carrier or truck maintenance section (attached or in support from headquarters and headquarters company, division transportation battalion.

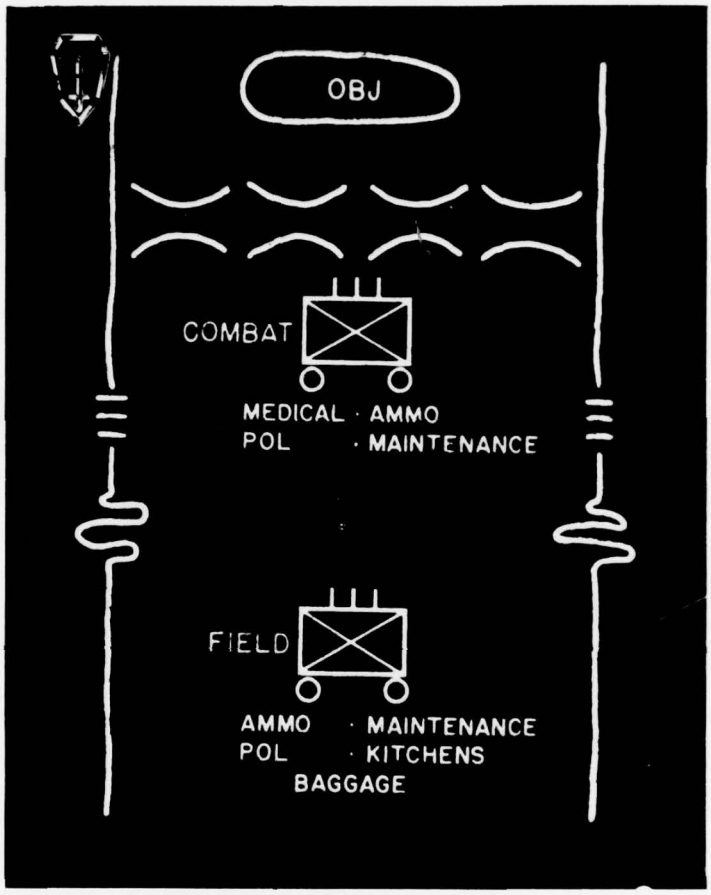

Figure 4. Composition Combat and Field Trains.

In defensive and retrograde operations, logistical support and installations in the forward areas are held to a minimum (Figure 5). This is done to preclude frequent interference with the tactical movement of combat units. Therefore, in defensive operations the combat trains are composed of the bare minimum. As an example, the combat trains may be composed only of medical trains. It could contain in addition, a class V vehicle, a class III vehicle (packaged gasoline) and a vehicle maintenance and evacuation contact team.

In offensive operations, a larger portion of the functional trains will be placed with the combat trains. This will be further increased when the battle group is mechanized. If the battle group is attacking on two axes, the combat trains will move on the axis from which it can best support both axes. When distance, routes or tactical disposition of the enemy preclude support from one axis of advance, an additional logistical support element will be established, and it will move on the unsupported axis (Figure 6).

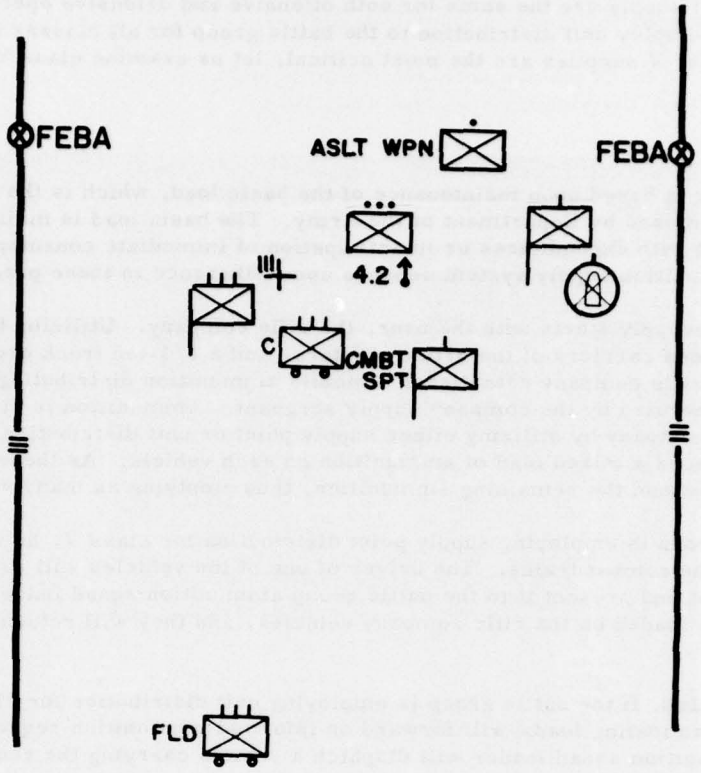

Figure 5. Type Defensive Situation.

EXAMPLE OF ATTACK FORMATION

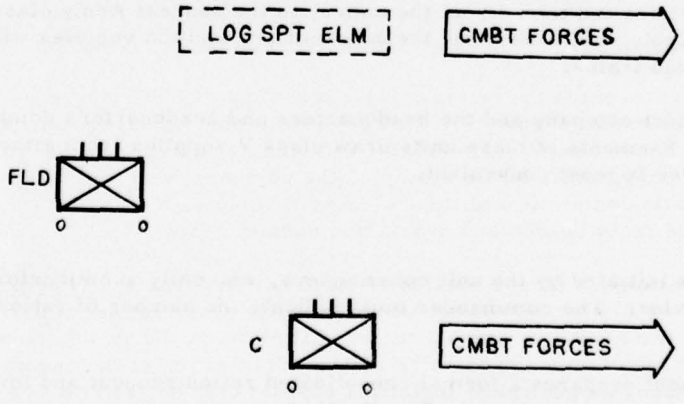

Figure 6. Type Offensive Formation.

The systems of supply are the same for both offensive and defensive operations. The division will normally employ unit distribution to the battle group for all classes of supply excepting class V. Since class V supplies are the most critical, let us examine class V resupply within the battle group.

CLASS V SUPPLY

Class V supply is based upon maintenance of the basic load, which is the prescribed amount of ammunition authorized by Department of the Army. The basic load is maintained by replenishment concurrent with expenditures or in anticipation of immediate consumption. Efficient operation of the ammunition supply system depends upon adherence to these precepts.

Ammunition resupply starts with the user, the rifle company. Utilizing the 3/4-ton trucks and trailers, weapons carriers of the 81mm mortars, and a 1/4-ton truck organic to company headquarters, the rifle company establishes a mobile ammunition distributing point (ADP). The company ADP is operated by the company supply sergeant. Ammunition is distributed to elements of the rifle company by utilizing either supply point or unit distribution. The company supply sergeant places a mixed load of ammunition on each vehicle. As these loads become depleted, he will transload the remaining ammunition, thus emptying as many vehicles as possible.

If the battle group is employing supply point distribution for class V, he will dispatch one or more vehicles to the combat trains. The driver of one of the vehicles will carry an informal ammunition request and present it to the battle group ammunition squad leader. The requested ammunition will be loaded on the rifle company vehicles, and they will return directly to the company ADP.

On the other hand, if the battle group is employing unit distribution for class V, the supply sergeant after consolidating loads will forward an informal ammunition request to the combat trains. The ammunition squad leader will dispatch a vehicle carrying the requested ammunition to the company ADP.

Depleted stocks of class V in the combat trains will be replenished from ammunition vehicles located with the field trains. To reconstitute the battle group basic load, the ammunition squad leader will forward an informal ammunition request to the supply element located in the field trains. The supply element will prepare a formal ammunition request. The assistant S4 will form a convoy and dispatch the convoy to the division ammunition office.

The division ammunition officer will check the ammunition request for completeness and accuracy. He will ascertain that any ammunition requested does not exceed an available supply rate which is in effect and then direct the convoy to the nearest Army class V supply point. The Army class V supply point will issue the ammunition, and the vehicles will return directly to the battle group field trains.

The combat support company and the headquarters and headquarters company do not operate company ADPs. Elements of these units draw class V supplies from either the combat or field trains, whichever is most convenient.

CLASS I SUPPLY

Class I supply is initiated by the unit commanders, who daily submit informal ration requests to the field trains. The commander must indicate the number of rations and the type of rations desired.

The supply element prepares a formal consolidated ration request and forwards it directly to the division quartermaster company. The division quartermaster company will normally employ unit distribution for class I supplies.

When the rations are received at the battle group class I distributing point, they are broken down into company-size lots based on each unit's ration request. If the kitchens are under battle group control, the mess stewards are notified, and they pick up their rations at the battle group class I distributing point. When the kitchens are under unit control, the battle group may employ either supply point or unit distribution.

CLASS III SUPPLY

Class III supply is initiated by the submission of daily class III estimates to the division quartermaster company. Requirements vary depending on the type of action anticipated, the terrain and the number of mechanized or motorized attachments.

The battle group normally has one 1200-gallon tank truck in support. If mechanized, or when tanks are attached, additional tank trucks are required. These tankers will be employed as mobile filling stations and effect unit distribution throughout the battle group. They may possibly be employed in the combat or field trains and effect supply point distribution. A combination of these two systems may be more practicable in some situations. Five-gallon cans are utilized in the combat trains to effect supply point distribution when it is not feasible to use tank trucks.

CLASS II SUPPLY

Requirements for class II supplies are generated within the units of the battle group. Units submit informal requests for class II supplies to the supply element located in the field trains.

The supply element prepares a formal requisition and forwards it directly to the appropriate technical service. Since unit distribution is normal for all classes of supplies except class V, division technical services will make distribution to the battle group field trains. Unless the supplies are critically needed or desired in large quantities, class II supplies are normally distributed with the rations.

Similarly, battle group will distribute class II supplies with the rations whenever possible.

CLASS IV SUPPLY

Requisitions for class IV constitute requests for items not included in prescribed allowance publications. These requests frequently must be submitted and processed through command channels, rather than supply channels as in the case of class II supplies.

When requesting fortification materials, the S4 may submit only a list of the items desired. Frequently, fortification materials, assault boats and bridging equipment are issued automatically, based upon operational needs and availability.

By employing combat and field trains, the battle group will provide better logistical support. The modern battlefield requires a flexible and a responsive logistical system. With the vehicles and personnel currently authorized, this can best be accomplished by employing two echelons of logistical support, i.e., combat and field trains.

Section V. ORGANIZATION OF DIVISION ARTILLERY

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Instructor, Artillery Committee, Associate Arms Group, Command and Staff Department

What is the purpose of a conference? By definition it is a discussion or an interchange of views. Here at the Infantry School we hold an instructors' conference so that we may exchange views and discuss the problems that we are faced with in presenting the newest developments in the tactical employment and organization of elements within the Infantry division.

Since a part of your scope of instruction concerns the planning for and use of supporting elements, it is felt that this discussion on the new organization of the Infantry division artillery will be both timely and of professional interest. In order to effectively present instruction concerning the use of this artillery support, it is imperative that you gain a thorough understanding of the organization and tactical employment of division artillery.

In this report we will discuss the following items:

1. Organization of the Infantry division artillery.
2. Organization of the howitzer battalions within the division artillery.
3. Organization of the rocket/howitzer battalion within the division artillery.
4. Changes that have been made in areas of common interest to all units in the division artillery.
5. Employment of division artillery, including organization for combat and tactical missions.

The new division artillery compares favorably in total number of pieces with the old triangular division. We have more 155mm howitzers available in the new organization. The 8" howitzer and the Honest John rocket represent an increase over the tubes formerly available and are a continuation of the ROCID concept of providing a nuclear delivery means to the division artillery. We also have both a towed and a self-propelled capability in the new division artillery. The self-propelled battalions give us a great deal more mobility and allow us to support a mechanized battle group.

Let us take a good look at this new division artillery and see what makes it function. The new division artillery is composed of a headquarters and headquarters battery, five howitzer battalions (three towed and two self-propelled) and one rocket/howitzer battalion.

Here you see a breakdown of the howitzer battalion (Figure 1).

We have a headquarters and headquarters battery, one 105mm howitzer battery and one 155mm howitzer battery.

The headquarters battery consists of the personnel you would expect to find in any headquarters battery. Of particular interest, however, is the target acquisition platoon which contains the survey and forward observer sections and the air control team. When division artillery authorizes it, two air observers will be made available to this platoon. A detailed breakdown of the personnel is given you in the Infantry Reference Data.

The 105mm howitzer battery consists of a battery headquarters, a communication section and the firing battery which has six sections containing one howitzer per section. The self-propelled 105mm howitzer battery is organized similarly, with the primary difference being the size of the

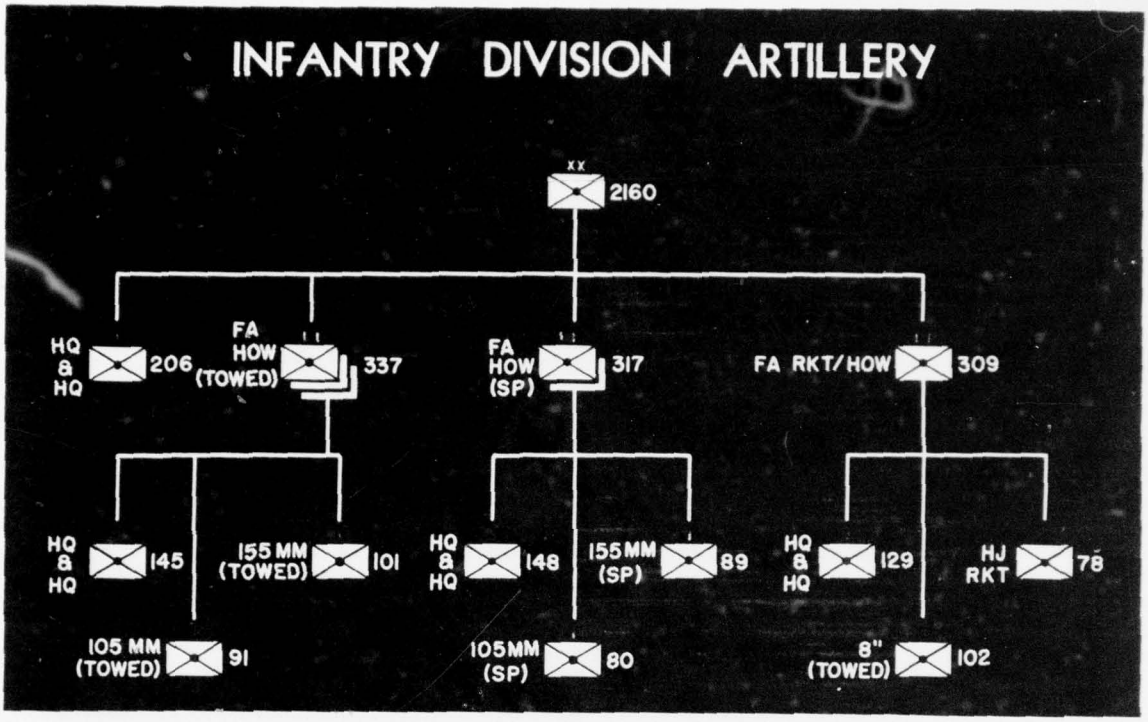

Figure 1. Infantry Division Artillery.

gun crews that man the weapons. Because of space limitations in the self-propelled battery there are fewer crew members in this unit. Personnel differences are indicated on the detailed breakdown of these two batteries in the Infantry Reference Data.

The 155mm howitzer battery is organized similarly to the 105mm howitzer battery with the primary difference once again being the complement of the gun crews.

Now that we have covered the organization of the howitzer units within the division artillery, let us take a look at the capabilities of these weapons so that we may better appreciate the fire support now available to the committed battle groups.

The towed 105mm howitzer takes about three minutes to emplace and fires a projectile approximately 11,200 meters at a maximum rate of six rounds per minute.

The self-propelled 105mm howitzer can be emplaced in approximately one minute and will fire the same projectile to the same maximum range. The maximum rate of fire with this weapon is four rounds per minute.

Now we shall take a look at the second member of the howitzer battalion, the 155mm nowitzer, towed. It takes about five minutes to emplace this weapon. It will fire a projectile approximately 14,900 meters and has a maximum rate of three rounds per minute. The self-propelled version of this weapon has the same range and rate of fire capabilities, but it takes just one minute to emplace.

So much for the howitzer battalion. A more detailed coverage of its organization and capabilities is presented in your Infantry Reference Data.

We are not finished with the artillery support for the Infantry division. We still have to cover the division commander's nuclear punch as well as his heavy artillery capability. All of this is present in the rocket/howitzer battalion. Here we find the same general setup, a headquarters and headquarters battery and two firing batteries, but this time one of them is a rocket battery. The headquarters is similar to that shown for the howitzer battalion, but there is just one forward observer section here and no forward air controller. The firing elements of this battalion are the 8" howitzer battery and the 762mm Honest John rocket battery. The 8" battery is classified as a heavy artillery battery and has the same basic organization as the 105mm and 155mm batteries. Here though, we only have four weapons per battery. The Honest John battery consists of a headquarters, a communications section, a fire direction center, two firing platoons and an assembly section. A detailed breakdown of these organizations can be found in the Infantry Reference Data.

What are the capabilities of these two batteries? The 8" howitzer can be emplaced in approximately one-half hour. It fires a projectile (high explosive) to a range of approximately 16,800 meters at a maximum rate of one round per minute, and it has nuclear capabilities.

The Honest John rocket is fired from a mobile launcher that can be emplaced in approximately one minute. The rocket can be fired to a maximum range of approximately 24,500 meters. There is no maximum rate of fire in the same sense as cannon artillery, since this weapon is not employed in this manner. The total traverse of the launcher is 60 degrees. This weapon also possesses nuclear as well as high-explosive capabilities.

These are the weapons which comprise the howitzer and the rocket/howitzer artillery battalions that are now available to the division commander. It is within the rocket/howitzer battalion that the "double barrelled" threat exists. Here is a highly accurate field piece capable of firing heavy artillery with extreme accuracy at pin-point targets. Simply by the changing of a fire command, this weapon can be converted into an instrument for delivering a nuclear weapon with an expectation of almost the same range and accuracy. Here, too, is the rocket battery with high explosive and nuclear capabilities similar to that of the 8" howitzer, with slightly different accuracies however.

The air defense units are still obtained from corps artillery which, as a matter of SOP, will attach one self-propelled battalion to each active division. Air defense units are not organic to the division.

There have been several significant changes made in the organizational structures of the batteries in the division artillery. It is obvious that to be successful, artillery must have good targets. This job has been given to the target acquisition platoons. One of these platoons is now organic to the division artillery headquarters battery, to each of the five howitzer battalions and to the rocket/howitzer battalion. At the battalion level, the platoon leader is the reconnaissance and survey officer. At division level the assistant S2 commands the platoon.

Another major organizational innovation is the location of the forward observer sections in the battalion headquarters batteries. The howitzer battalions have one observer for each of the five rifle companies of the Infantry battle group. The rocket/howitzer battalion has one forward observer section.

An air control team is included in the target acquisition platoon of the division artillery headquarters battery and the five howitzer battalions. Each team contains the necessary radios,

operators, and vehicles required by the U. S. Air Force tactical air controller to direct air strikes. The survey section is now concentrated at battalion level, and this section is also a part of the target acquisition platoon.

A valuable addition to the division artillery headquarters battery is the surveillance radar section. This section consists of a seven-man radar team equipped with a ground surveillance radar AN/TPS-25, a set which can detect moving objects at long range.

When authorized by the Department of the Army, the howitzer battalions and the rocket/howitzer battalion each will be augmented by two air observers. Army aircraft for the division artillery are furnished by the artillery flight of the division combat aviation company.

Each howitzer battery now has three officers, one the battery commander, and the other two members of the firing battery proper. As I mentioned earlier, reconnaissance and survey and forward observer officers are now at battalion level. The rocket battery has basically the same organization except the fire direction center and the assembly section each have an officer.

The requirements of the battlefield of the future were the paramount considerations on which the U. S. Army Artillery and Missile School based its recommendations for the new division artillery. This does not mean that the tactical fundamentals developed in World War II and the Korean conflict were ignored. On the contrary, it was evident that past lessons would add the required balance to the forecast of the future. Hence, the general fundamentals which govern the employment of field artillery continue to apply.

A discussion of all tactics and techniques concerning the new division artillery would become involved and lengthy. Consequently, this discussion is limited to general fundamentals, organization for combat and tactical missions, tactical employment of Infantry division artillery units and coordination of operations with the Infantry mortar platoon.

The major difference between organizing for combat in the ROCID and the new division artilleries lies in the relative simplicity and flexibility afforded by the new organization. The inherent responsibilities of the direct support mission require that the howitzer battalion (direct support) be responsive to the needs of the battle group while the division artillery, as a whole, is responsive to the requirements of the division. The primary purpose of organizing for combat remains twofold: (1) to place each artillery unit in a tactical organization and (2) to assign each unit a tactical mission. In addition to the present missions of direct support, reinforcing and general support, a review by the Artillery School at Fort Sill and contact with artillerymen in the field has shown a definite requirement for restoring the mission of general support and reinforcing as a separate tactical mission.

Two general lines of guidance can be followed in the assignment of tactical missions to division artillery battalions. First, one howitzer battalion normally will be in direct support of each committed battle group, and, second, the rocket/howitzer battalion will be given a mission of general support. I emphasize the fact that these are guide lines only and not a hard-and-fast rule. The mission assigned to the artillery will, as always, determine the appropriate organization for combat and tactical missions.

Let us set up a hypothetical problem and see what all of this conversation really means. First, consider an attack situation; three battle groups forward and two in reserve. The first consideration is one of organizing for combat, and this is based on the concept of operation as announced by the division commander. Our organization must allow us to perform our mission of support of the division as a whole. Right now let us say that the main effort of the attack has been made in the center battle group's area. First and foremost, we must support the division

as a whole, and that means the use of one direct support battalion with each committed battle group. So let's put one direct support battalion with each of the forward battle groups. Now then, we have two battle groups left over. Normally artillery is not held in reserve, and this holds true here; even though their "teammate" battle groups are in reserve, we shall use them. Since the main effort is in the area of the center battle group, we should weight the main effort with additional artillery fire; so let's put one more howitzer battalion in this zone. The other howitzer battalion can be used to support the secondary effort or in support of the entire zone, within range capabilities.

Now that we have decided just how we will employ our five direct support battalions, the task arises of assigning each of them a mission. Since the battle group no longer has an artillery unit organic to it, it rests with the direct support battalion to furnish forward observers, liaison, and communications to the supported battle group. We do this by assigning a mission of direct support to each of the three howitzer battalions supporting the committed battle groups. This means that there will be a forward observer with each rifle company. Liaison will be established with the battle group headquarters, and a liaison officer will remain there. The necessary communications will be established by the direct support battalion. The howitzer battalion will lend support in the zone of action of the supported unit and will answer calls for fire from its own observers and higher headquarters. The decision to displace rests with the battalion commander, and he will move when it is necessary for him to do so in order to accomplish his mission of close and continuous fire support. In addition to his position as battalion commander, he will also act as the fire support coordinator to the battle group commander. As such, he will coordinate the fire planning for the battle group and coordinate with higher artillery headquarters for additional artillery fires that he may need. Coordination is effected with the heavy mortar platoon (4.2-inch) organic to the battle group. Although the heavy mortar platoon is an Infantry unit and is responsive to the desires of the battle group commander, close coordination and communication is maintained between the platoon and the direct support battalion. This allows the heavy mortar platoon to either request or receive fire missions directly from the direct support battalion. Just which situation will apply is dependent on the desires of the battle group commander, and he still retains the authority of withdrawing the heavy mortar platoon and using it wherever he desires. This then is direct support.

What about the other battalion that was going to be used to weight the main effort? Since artillery units are under the control of artillery headquarters and not the supported units, the decision to place this unit in a reinforcing role will come from the division artillery commander. Another direct support battalion for the battle group will only cause confusion. As a reinforcing battalion, this unit will reinforce the fires of the direct support battalion. Liaison and communications will be established with the reinforced unit; the zone of action will be the zone of action of the reinforced unit. The battalion will answer calls for fire from the reinforced unit and higher headquarters. Should it be necessary to displace, the unit will do so upon the request of the reinforced unit or upon orders from higher headquarters. No forward observers will be provided unless the reinforced unit specifically asks for them. Should our other battalion be used to weight the secondary effort, it will be used in exactly the same manner as depicted here. Let us say that the zone on the left is the secondary effort, and we will use this unit to reinforce the fires of the direct support battalion in that zone.

This leaves us with the rocket/howitzer battalion. What shall we do with it? Well, let's consider the situation for a moment. There are two firing batteries in this battalion, and it is best to retain these two batteries under the control of the parent battalion. Centralized control is necessary when you consider the implications inherent in the use of a nuclear weapon, and it is in this battalion that the nuclear-delivery capability rests. A nonnuclear capability is also possible, and the 8" battery can be employed to good advantage in the destruction of "hard" targets in a nonnuclear situation. A tactical mission of general support will be assigned to this

battalion, and it will remain under the control of division artillery. Under these conditions the battalion will answer calls for fire from the next higher headquarters or its own observers. No liaison, communications or forward observers will be provided unless directed by higher headquarters. The battalion zone of action is the zone of action of the whole division, and it will displace upon the order of the next higher headquarters.

A modification of the mission of general support can be made by assigning a mission of general support-reinforcing. General support-reinforcing artillery has the mission of supporting the force as a whole, just as in a general support role with the additional mission of providing reinforcing fires for another artillery unit. A unit with this mission displaces on order of the next higher artillery commander, or as requested by the reinforced unit subject to approval of the next higher artillery commander. Priority of fires is to the force as a whole, unless otherwise specified by the force commander.

I have discussed the basic considerations in the employment of the new division artillery. Another consideration is the employment of batteries when detached from their parent battalions. It should no longer be necessary to transfer batteries between battalions to meet changes in the tactical situation. However, there will be cases when the temporary attachment of a battery may be required. Such cases may include support of task forces in exploitation or pursuit, support of security forces such as those which occupy a general outpost line, or the temporary replacement of noneffective units. When it is desirable to detach one or two 8" howitzer sections to execute a mission, the augmentation required must be furnished by the battalion, except for fire direction personnel and equipment. The battery cannot provide the required survey and communications means. Honest John and 8" howitzer platoons may be attached to another artillery headquarters. The organization and equipment of the Honest John battery make the battery capable of operating by platoon for limited periods.

The artillery portion of the operations order is always found in paragraph 3. Just where in the paragraph varies with the organizations in the division operations order.

Here is another version of organization for combat. This organization is designed to provide artillery fire support in a defensive situation. The artillery battalions not actually with the forward battle groups have been given a mission of general support and a zone of action. This requires them to physically position their weapons in this zone with the result that because of range and traverse limitations, the bulk of their fires will be in support of that zone. Additionally, a priority of fires could be assigned to these units with the result that likely avenues of approach would be supported by the bulk of the artillery fires.

A requirement beyond the capabilities of the division artillery to support can be referred to corps artillery. Here you find the artillery that is supporting the corps effort. A great number of medium and heavy artillery pieces can be expected in this unit. Since corps artillery has no organic artillery units, it is tailor-made to fit the particular situation. At this level can be found additional missile and rocket units in support of the corps as a whole. Honest John, Lacrosse, and Corporal battalions are available to support the division efforts. Under some conditions the Redstone missile might be present also. The longer range missiles would be found under Army control. A request for fire can bring fires from all of these units if the size and nature of the target warrants it.

What we have been discussing is as new as tomorrow; in fact, it is tomorrow's artillery support. The new division artillery is designed to give greater flexibility and fire power to the division as a whole. Organization for combat has been simplified greatly by the development of five howitzer battalions and one rocket/howitzer battalion for each Infantry division. These units are organized for combat and given a tactical mission commensurate with the concept of operations and the mission of the Artillery. There are additional fires available at corps artillery level to include rocket and missile units.

As instructors, you present approved procedures for offensive and defensive situations. A part of this procedure is a correct evaluation of the capabilities and amounts of artillery available to the Infantry commander. If you, as Infantry instructors, are to be effective in your assignments at other branch installations, you must understand the role of supporting artillery fires for the new Infantry division.

Section VI. COMBAT SURVEILLANCE

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Combat intelligence is knowledge of the weather, terrain and the enemy which is used in the planning and conduct of tactical operations. Information relative to weather and terrain is readily available from studies, maps and aerial photographs. However, knowledge of the enemy, which is the most important factor in intelligence production, is difficult to secure.

With the advent of nuclear warfare, which is characterized by the depopulated battlefield, dispersion and high speed mobility, target acquisition time must be reduced to a minimum in order that our mobility and firepower can be exploited. At present, this is seldom possible because our primary means of gathering information about the enemy depends on "eyeball" observation which is influenced adversely by light and weather conditions.

To extend our surveillance over the battle area, a family of ground radars and aerial sensory devices have been developed and made organic to the present Infantry division, and will be available for troop issue during 1960.

In this report we will concern ourselves with a discussion of the capabilities and limitations of these radar devices, organization of the Infantry division battle group radar section and Infantry division aerial surveillance platoon, the S2's responsibilities for surveillance, and the techniques involved in the preparation of the battle group radar surveillance plan.

Figure 1. Area of Interest and Influence.

Before we start our discussion, certain terms must be defined:

1. Combat surveillance is a continuous all-weather, day and night systematic watch over the battle area to provide timely information for tactical ground combat operations.

2. Area of influence is the area of operation wherein the commander is capable of directly influencing the progress or outcome of combat operations by maneuver or by the delivery of firepower with the fire support system under his control (Figure 1).

3. Area of interest extends to a depth beyond the area of influence that permits planning for the forward extension of the area of influence. It may contain enemy forces, which if employed in the area of influence, could jeopardize the accomplishment of the mission.

4. Target acquisition is that part of combat intelligence which involves the detection, identification, and location of a target in sufficient detail to permit target analysis and the effective employment of weapons.

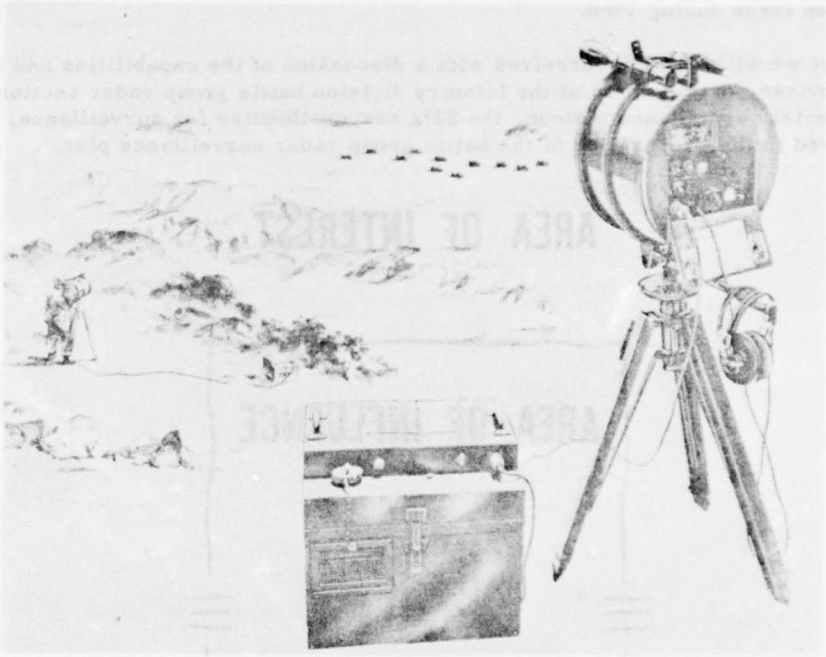

Figure 2. Short Range Radar (AN/PPS-4).

Now that we are familiar with some of the terms associated with combat surveillance, we will turn our attention to examining the characteristics of surveillance devices organic to the Infantry division. The devices we shall consider first are the ground radars.

Ground radars have the capability of detecting and locating moving targets which are located within the line of sight range capability of the device. Through an analysis of the radar audio tone return, the operator has the capability of determining range, azimuth and speed of the detected target. The inability of the radars to penetrate dense undergrowth and masked areas greatly influences the employment and capabilities of the radars. The following capabilities are characteristic of ground radars organic to the Infantry division.

The short range radar AN/PPS-4 (Figure 2) can detect moving individuals at 3500 meters and moving vehicles at 6000 meters. It weighs 108 pounds and can be transported on two standard pack boards or installed in vehicles. Five such devices are organic to the battle group.

The medium range radar set AN/TPS-21 (Figure 3) can detect moving individuals at 5000 meters and moving vehicles at 20,000 meters. It weighs approximately 240 pounds and can be transported on five standard pack boards. Two such devices are organic to the battle group.

The long range radar set AN/TPS-25 (Figure 4) can detect moving individuals at 10,000 meters and moving vehicles at 20,000 meters. It weighs approximately 2300 pounds and is transported on a one and one-half ton trailer. One such device is organic to division artillery.

We have examined the ground surveillance devices and will now study the characteristics of the airborne sensory devices and related equipment organic to the Infantry division.

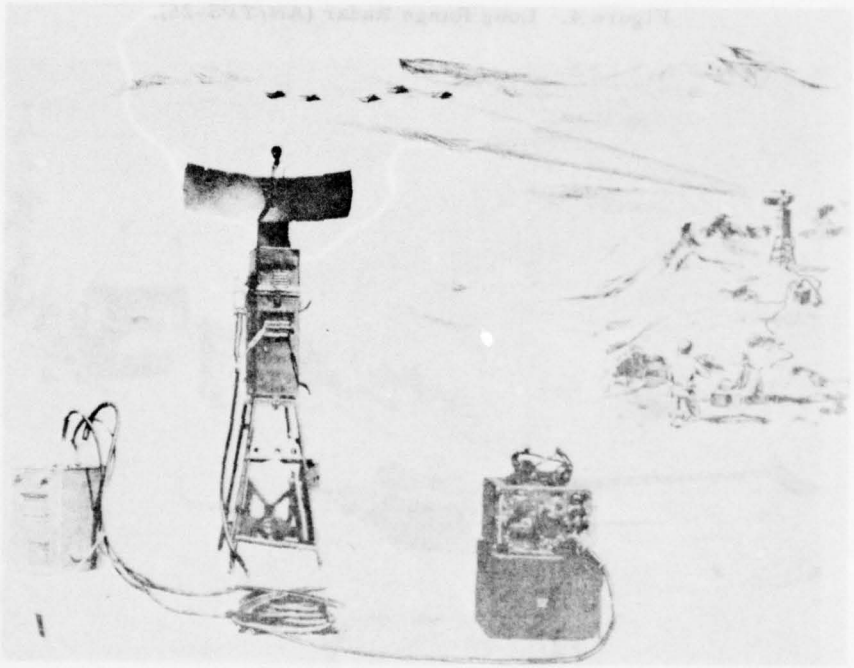

Figure 3. Medium Range Radar (AN/TPS-21).

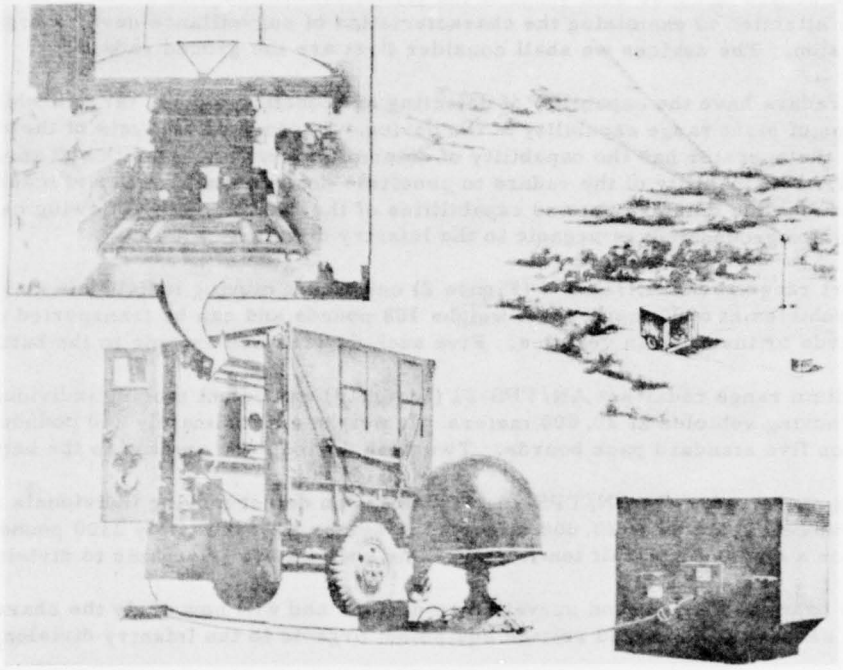

Figure 4. Long Range Radar (AN/TPS-25).

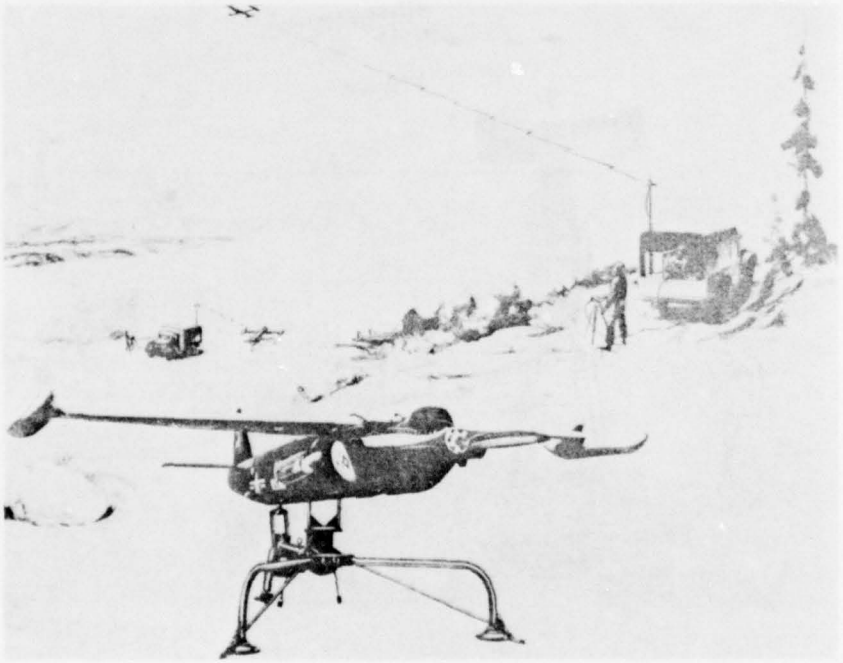

Figure 5. Drone (ANUSD-1).

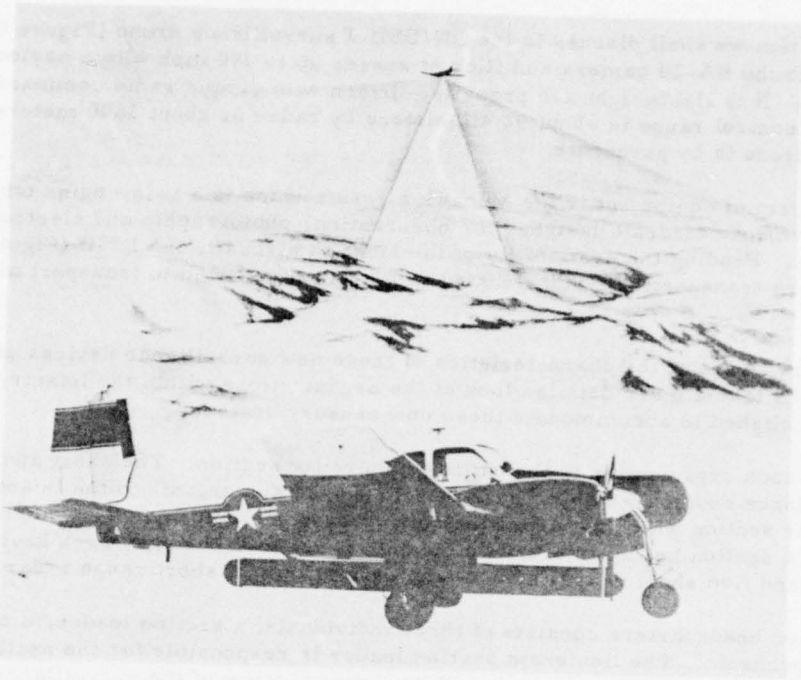

Figure 6. L 23-D Aircraft Mounting Side-Looking Radar.

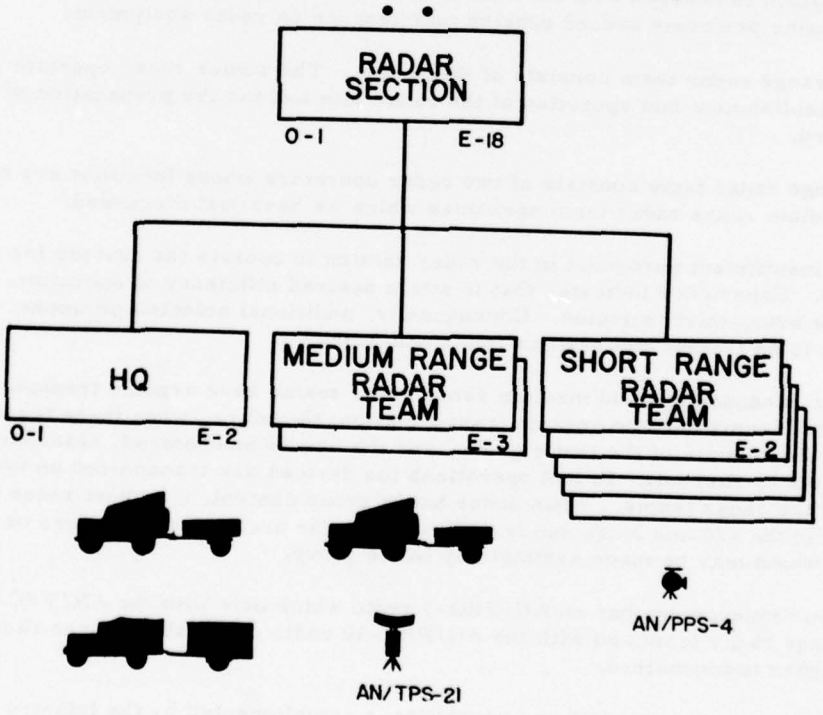

Figure 7. Radar Section, Infantry Division Battle Group.

The first item we shall discuss is the AN/USD-1 surveillance drone (Figure 5). The drone is equipped with the KA-20 camera and flies at speeds up to 190 mph with a payload of 90 pounds for 30 minutes. It is lightweight and propeller-driven with simple radio command guidance. The maximum control range is about 92 kilometers by radar or about 3600 meters visually. Recovery of the drone is by parachute.

The next item of equipment is the Mohawk aircraft which is a twin-engine turbo-prop, medium-performance aircraft designed for observation, photographic and electronic surveillance missions. Pending the availability of the Mohawk aircraft, the L23D (Figure 6) aircraft shown here transporting a side-looking radar will be utilized to transport airborne sensory devices.

We are now aware of the characteristics of these new surveillance devices earmarked for Infantry and will take a more detailed look at the organizations within the Infantry division which have been established to accommodate these new sensory devices.

The first such organization is the battle group radar section. The short and medium range radar surveillance devices which we have just discussed are organic to the Infantry division battle group radar section which is part of the combat support company. The radar section (Figure 7) consists of a section headquarters, two medium range radar teams, each having a medium range radar, and five short range radar teams, each having a short range radar.

The section headquarters consists of three individuals; a section leader, a section sergeant and a radar mechanic. The lieutenant section leader is responsible for the section's training, control, tactical employment and supply. Within the guidance of the surveillance plan, he selects positions and areas of coverage for the radar teams employed under battle group control. The section sergeant is charged with the administrative and logistical functions of the section. The radar mechanic performs second echelon maintenance on radar equipment.

A medium range radar team consists of three men. The senior radar operator is responsible for the establishment and operation of the radar site and for the preparation of the radar surveillance card.

A short range radar team consists of two radar operators whose functions are similar to those of the medium range radar team operators which we have just discussed.

There are insufficient personnel in the radar section to operate the devices for prolonged periods of time. Experience indicates that to attain desired efficiency of operation, operators should alternate every thirty minutes. Consequently, additional selected personnel of the battle group will have to be trained and used as radar operators.

The section headquarters and medium range radar teams have organic transportation. The short range radar teams have no organic transportation; therefore, when these teams are attached to subordinate units of the battle group, and the unit is mechanized, transportation must be made available by that unit. In foot operations the devices are transported on two standard pack boards by the radar teams. When under battle group control, the short range radars may be transported in the 3/4-ton truck and trailer of the radar section headquarters or in other transportation which may be made available by battle group.

The section headquarters has an AN/VRQ-3 radio which nets with the AN/VRC-10 radio of the medium range radar team and with the AN/PRC-10 radio of the short range radar team, as well as with higher headquarters.

The battle group radar surveillance capability is complemented by the Infantry division aerial surveillance platoon (Figure 8).

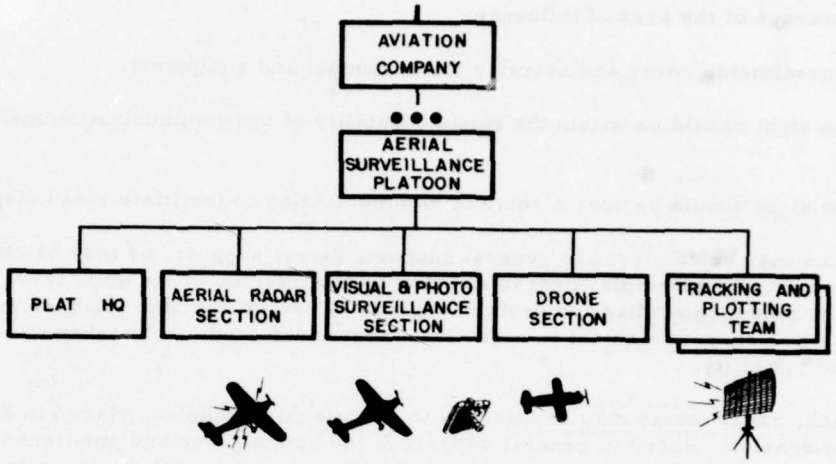

Figure 8. Aerial Surveillance Platoon, Infantry Division Aviation Company.

The aerial surveillance platoon is organic to the division aviation company and has the mission of providing aerial surveillance coverage of the division area of influence. The platoon furnishes information of enemy movement, provides security for the unit, acquires targets, takes aerial photographs and imagery, and assists in obtaining information for use in the conduct of post-strike analysis of nuclear weapons effects. Normally, the platoon is employed as a unit, but its organizational structure permits attachment of sections to subordinate elements.

The aerial radar section consists of two Mohawk aircraft. Aerial radars mounted on these aircraft have the capability of producing imagery of prominent terrain features and moving enemy targets.

The visual and photograph surveillance section also consists of two Mohawk aircraft. Cameras (KA-20) mounted on these aircraft provide a day and night photographic capability for the division.

The drone section consists of twelve drones, which are controlled in flight by a drone controller. The controller obtains information on location and altitude of the drone from a plotting board in the tracking and plotting team radar van. Photographic equipment mounted in these drones provides the division with a capability of deep penetration of enemy-held areas.

The battle group S2 has primary staff responsibility for the employment of the radar section and he recommends the method of employment of the radar section to the commander. He prepares a radar surveillance plan to support the battle group mission. He also designates the general site locations and specific areas of radar surveillance coverage, to include the frequency of coverage desired, for radar devices under battle group control.

The general site locations for the radar teams, initially selected by a map reconnaissance, should have the same characteristics required for an observation post with emphasis on the following:

1. Coverage of the area of influence.

2. Concealment, cover and security for personnel and equipment.

3. The sight should be within the range capability of the communication means being employed.

4. The sight should be near a route of communication to facilitate rapid displacement.

Radar teams may be employed in general support, direct support, or may be attached to subordinate elements. The employment is affected by the mission of the unit, terrain, enemy capabilities, equipment capability and desired degrees of sector overlap. Radars must be coordinated with the fire support element in order that targets detected can be taken under fire under all conditions of visibility.

In the attack, radar teams may be attached to the attacking echelon, placed in direct support of the attacking echelon, placed in general support of the battle group and positioned near the battle group reserve, or attached to elements charged with rear area or flank security.

In the defense, radar teams may be attached to elements occupying the COPL, attached to units occupying the FEBA, or placed in general support of the battle group. Generally, short range radar teams are attached to units occupying the FEBA and the medium range radar teams are maintained in general support.

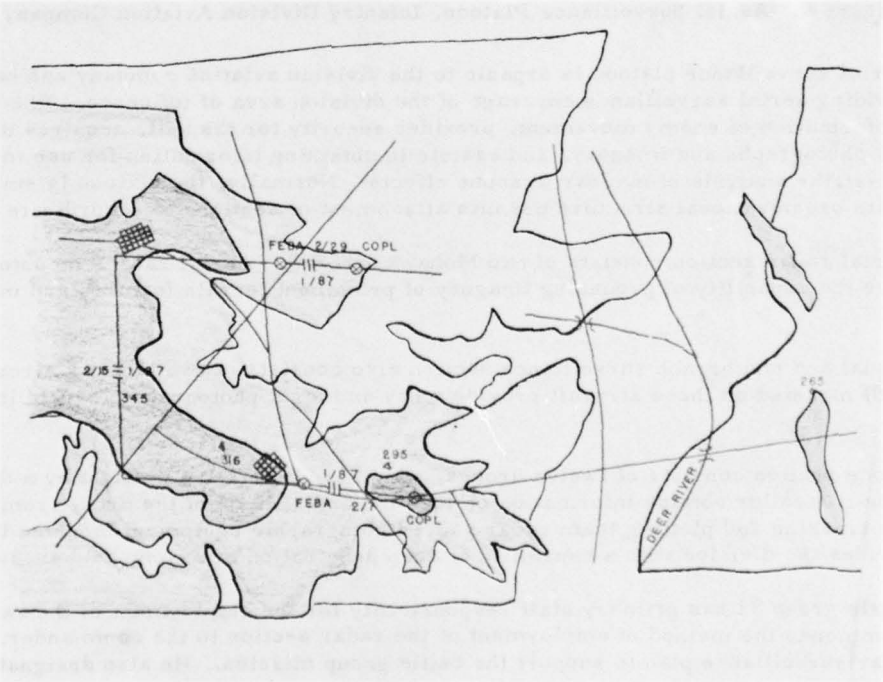

Figure 9. Position Defense 1st BG, 87th Inf.

In retrograde operations radar sites or positions are selected for displacement of the medium range radar teams. These positions are prepared and tentative radar surveillance cards initiated. The section leader or section sergeant and senior radar operator will conduct reconnaissance and ensure that radar positions are prepared during daylight hours. Medium range radar teams may remain with detachments left in contact in a night withdrawal, in which case they are attached to a unit for the withdrawal. Short range radar teams operate under the control of the company or subordinate unit to which they are attached. The team may operate with detachments left in contact or displace to new surveillance sites in a manner similar to the displacement of the medium range radar teams.

For the remainder of this report, place yourself in the position of the battle group S2 who is in the process of preparing the battle group radar surveillance plan for the defense of the area depicted on this slide (Figure 9). We will use this tactical situation to portray the steps which the S2 goes through in the preparation of a radar surveillance plan.

The purpose of the radar surveillance plan is to achieve the best coverage of the area of influence and area of interest and to establish command relationship among the radar teams and the units in whose area they are located.

The first step in preparing the battle group radar surveillance plan is to analyze the terrain in the area of influence and area of interest. The purpose of this analysis is to determine avenues of approach to and into the battle area as well as critical points where there may be enemy activity which will provide indications as to the enemy's probable courses of action. The terrain is analyzed in order to determine locations from which long range line of sight coverage is available over the areas or critical points selected. In this situation, four avenues of approach and two critical points were selected (Figure 10).

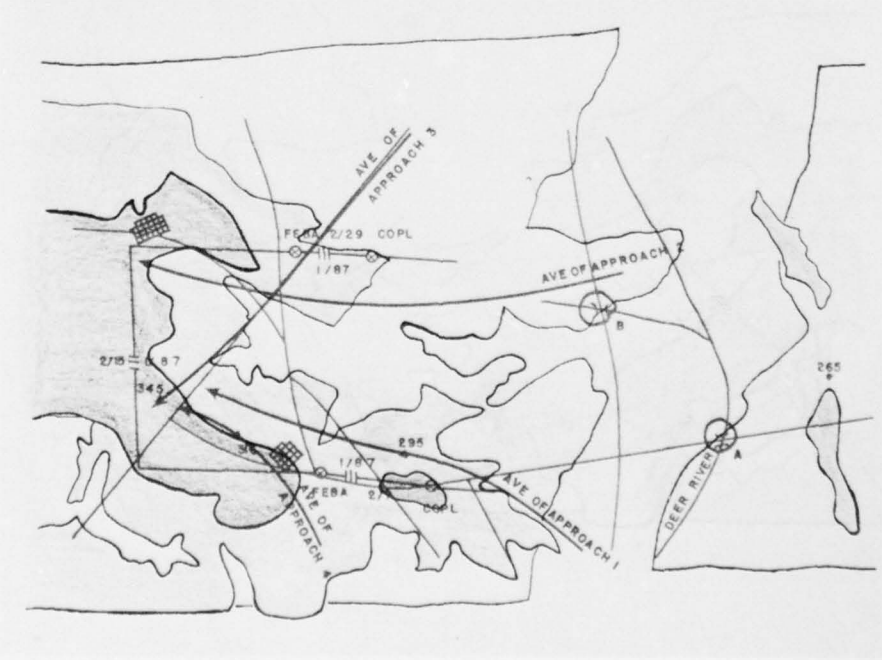

Figure 10. Avenues of Approach.

The second step in the preparation of the surveillance plan is the assignment of priorities of importance to areas and critical points selected as a result of the terrain analysis. Priorities are established based on the mission, terrain and enemy capabilities.

In this situation, considering the mission and terrain, avenue of approach Number 1 along the high ground is the most dangerous since it uses HILL 295 and continues along to the critical terrain feature HILL 345. Avenue of approach Number 2 along the low ground is less dangerous than avenue of approach Number 1 since it does not lead immediately to high ground in the battle area. Avenue of approach Number 3 is less dangerous than avenue of approach Number 2 since it enters through an adjacent battle group defensive area and does not lead immediately to high ground. Avenue of approach Number 4 from a terrain standpoint is more dangerous than avenues of approach Numbers 2 and 3 as it leads immediately to critical terrain in the battle area. However, it is assigned a lesser priority of importance since it commences in an adjacent battle group area. In addition, these ground radars do not as yet have the capability of distinguishing between friend and foe. In the event the adjacent battle groups are required to withdraw, the priorities of importance for avenues of approach must be readjusted in order to adequately cover avenues of approach Numbers 3 and 4.

Additionally, critical points are selected and designated by letter in order of priority of importance. Point A is assigned the highest priority of importance because enemy movement into our defensive area along the most dangerous avenue of approach may utilize the bridge located at point A. Point B is assigned the second priority of importance since enemy movement into our defensive area along avenue of approach Number 2 may utilize the bridge located at point B.

Figure 11. General Site Locations of Radars on COPL.

It is desirable to achieve complete radar surveillance coverage of the area of interest so that the enemy can be taken under fire when he enters the area of influence. However, the capability of achieving complete radar surveillance coverage is seldom possible because of the limited number of radar devices available and the configuration of the terrain.

The third step in the preparation of the battle group surveillance plan is the selection of general site locations and area of coverage for the medium and short range radars.

The purpose of selecting general site locations is to determine the combination of site locations and radar devices which provides the highest degree of coverage for the area of influence. In order to obtain the best combination, the S2 analyzes the general site locations in relation to areas to be covered and the range capabilities of the radars.

In this situation, the S2 considers the general site locations and areas of coverage prior to and after the withdrawal of the COPL. For ease of understanding we show the general site locations and areas of coverage for the short and medium range radars on the COPL (Figure 11). The general site locations for short range radars employed on the COPL will provide coverage of avenues of approach Numbers 1 and 2. The general site location of the medium range radar will extend the surveillance coverage of the battle group and cover the most dangerous avenue of approach into the battle area.

After withdrawal of the COPL (Figure 12), the general site locations for the short range radars provide coverage of avenues of approach Numbers 1, 2 and 3. The general site locations

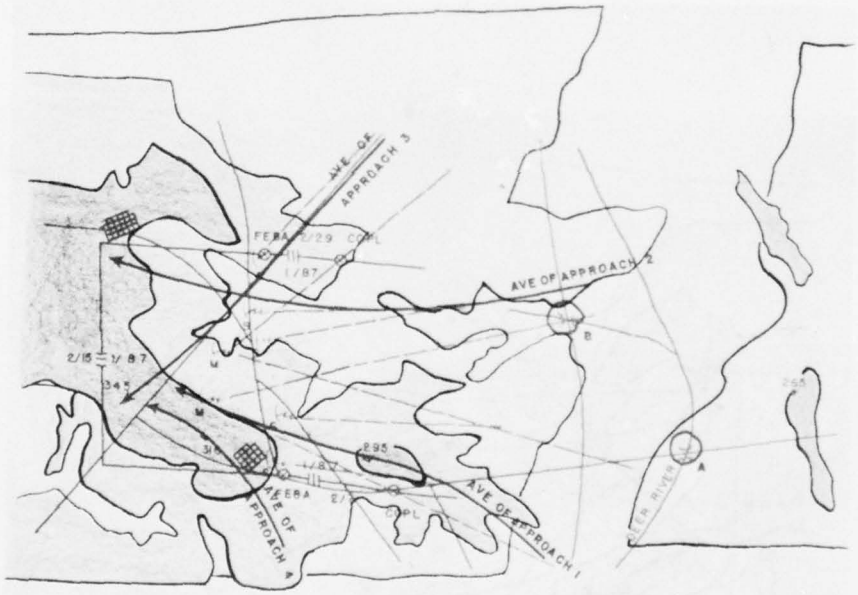

Figure 12. General Site Locations of Radars on FEBA.

for the medium range radars add depth and overlap the coverage of the short range radars and cover critical points A and B. This coverage is in keeping with priorities of importance established for avenues of approach and critical points.

Generally, the area of coverage of the medium range radars encompasses avenues of approach to the battle area as well as critical points located beyond the range capability of the short range radars. The short range radars are assigned areas of coverage, avenues of approach into the battle areas as well as selected critical points located within their range capability and which cannot be covered by medium range radars.

The fourth step in the preparation of the surveillance plan is the recommendation by the S2 to the S3 as to the employment of the radar teams; such as, general support, direct support or attachment to subordinate units. In order for the S2 to make the recommendation, he coordinates with the S3 to determine the disposition of rifle companies in order that the proper command relationship may be established among the radar teams and the units in whose area they are located. When the recommended employment is approved by the commander, it is published in the operation order. Areas to be covered by radars under battle group control are depicted on an overlay accompanying the operation order.

In this situation, the S3 shows the boundaries, limiting points and disposition of forces which he proposes to recommend to the battle group commander and states that he will recommend that the forward companies, garrison, command and control the COPL (Figure 13).

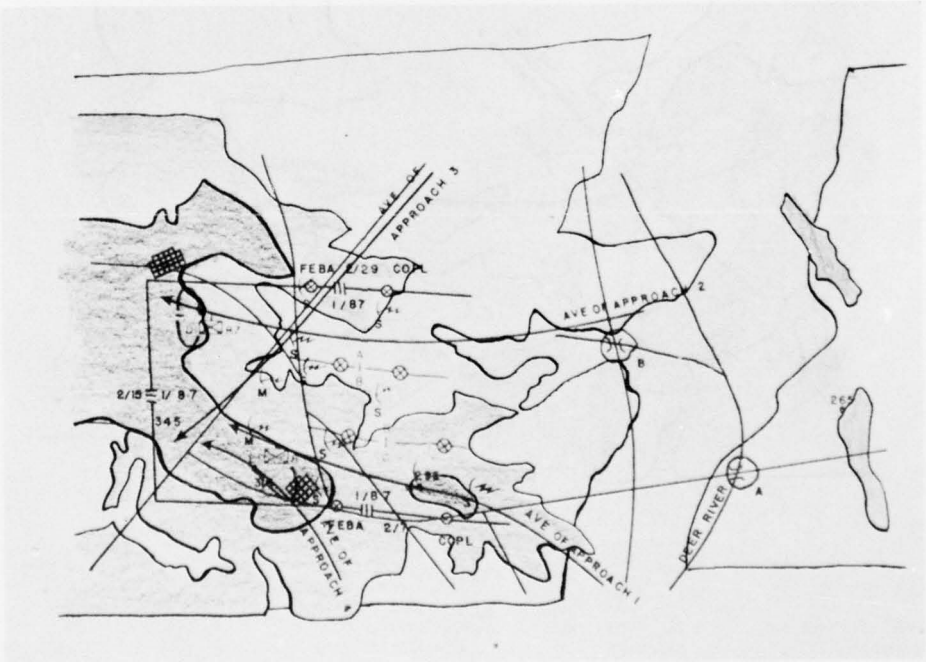

Figure 13. Assignment of Radars to Units.

Based on the organization of the battle area, and considering that the most dangerous avenues of approach are located in Company A and C areas of responsibility, you recommend to the S3 that two short range radar teams be attached to each of these companies and one short range radar team be attached to Company B. The terrain forward of and adjacent to Company B is of such a configuration that acceptable coverage of avenue of approach Number 2 can be achieved by utilizing only one short range radar.

You further recommend that a medium range radar team be attached to Company C for employment on the COPL, in order to achieve the best possible radar coverage of the most dangerous avenue of approach into the battle area. Upon withdrawal of the COPL, the medium range radar team reverts to battle group control. The second medium range radar team is retained in general support to add depth to all short range radar teams prior to and after withdrawal of the COPL.

The forward rifle companies need a radar surveillance capability for reasons of security and target acquisition. The range of the short range radar is compatible with the organic fire support available to the rifle companies and provides an acceptable reaction time for the company commander. In consideration of these factors and others, (such as lack of organic transport, inability to provide for their own local security and limited communications), it is necessary that short range radar teams normally be attached to rifle companies.

The exact location of all radar surveillance devices and the area of coverage of each, to include masked areas, is plotted on the battle group radar coverage diagram. Each radar team prepares a radar surveillance card (Figure 14) which is similar in content to the range card prepared for crew-served weapons. The radar section leader using the surveillance cards and knowledge gained as a result of his ground reconnaissance, prepares a radar coverage diagram and submits it to the S2. Subordinate commanders having attached radars do likewise.

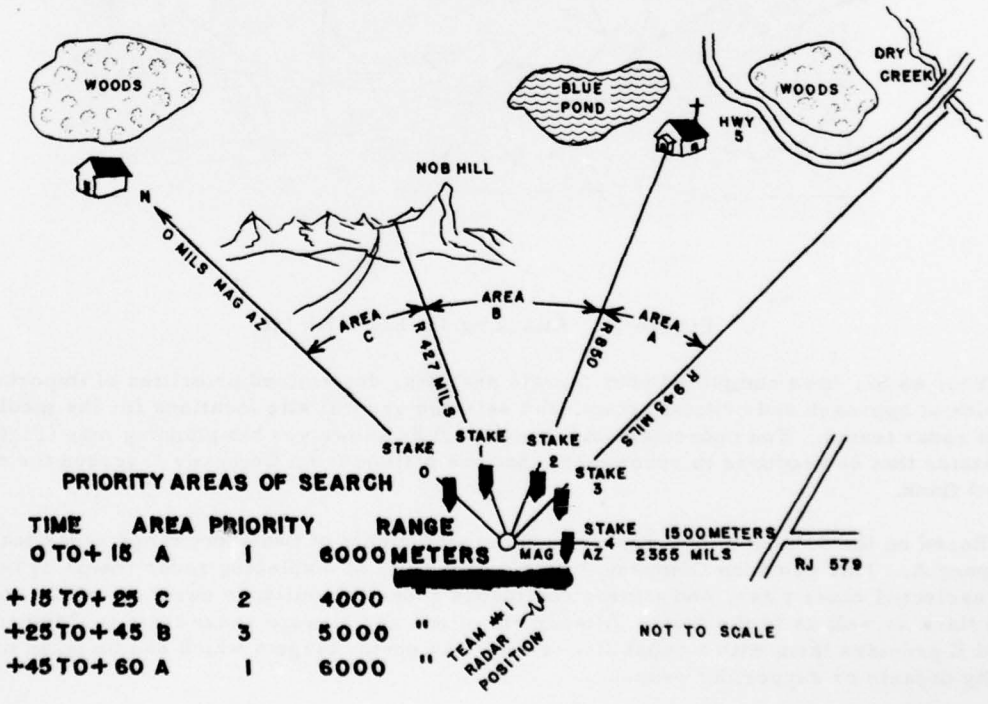

Figure 14. Radar Surveillance Card.

The completed battle group radar coverage diagram may be consolidated, when practical, with other reconnaissance and surveillance diagrams available to the battle group, such as the patrol plan and location of observation post(s). The consolidated diagram is known as the battle group surveillance diagram. This surveillance coverage diagram is furnished to division for incorporation into the division surveillance coverage diagram.

So much for the consideration of the defense. Let us now examine a method of employment of the radar section in an attack situation.

1st Battle Group, 87th Infantry has received a division warning order stating "* * * 1st BG, 87th Inf attacks 110530 Aug to the east and seize Obj 1/87 * * *" (Figure 15).

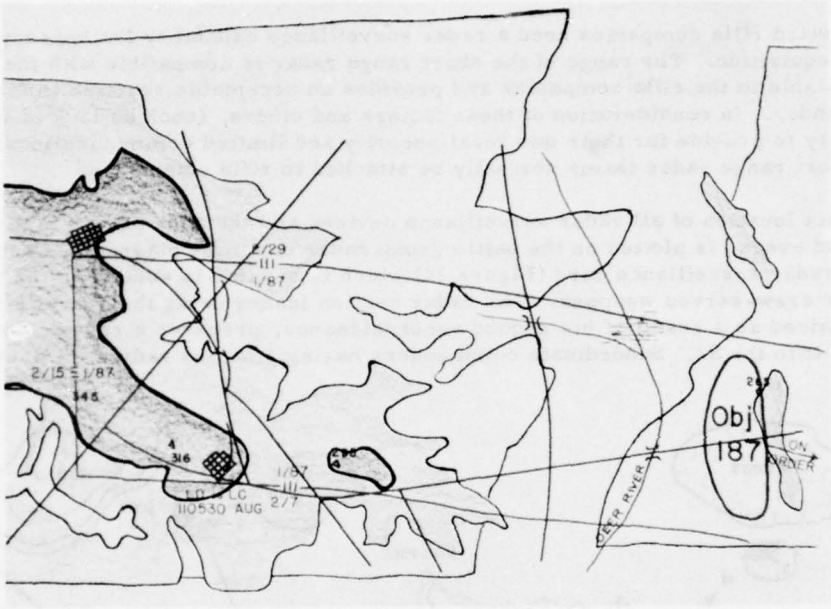

Figure 15. Attack by 1st BG, 87th Inf.

You, as S2, have completed your terrain analysis, determined priorities of importance of avenues of approach and critical points, and selected general site locations for the medium range radar teams. You coordinate with the S3 and he shows you his planning map (Figure 16) and states that he proposes to recommend that one platoon from Company E screen the south (right) flank.

Based on the S3's plan, you recommend the attachment of two short range radar teams to Company A. This provides Company A with a capability of displacing radar teams by bounds, to preselected radar sites, and affords continuous radar surveillance coverage of the north (left) flank as well as to the front. Attachment of one short range radar team to Companies B, C and E provides them with a capability of detecting enemy targets which can be taken under fire by organic or supporting weapons.

Attachment of a short range radar team to Company E for employment by the platoon screening the south (right) flank, provides it with a radar surveillance capability, thereby assisting

in the accomplishment of its security mission. Since the battle group is conducting a dismounted attack, the short range radar team is attached and is capable of displacing at the rate of advance of the platoon.

Figure 16. S3 Planning Map for Attack by 1st BG, 87th Inf.

You recommend that the two medium range radar teams be employed in general support to add depth to the overall radar surveillance coverage of the battle group zone of action. With their organic transportation, they can rapidly displace to preselected radar sites and their organic communication ensures rapid reporting of information detected by the teams.

The battle group S2 has the staff responsibility for preparing the battle group surveillance plan and recommends the employment of the radar section. The employment is dictated by an analysis of the total battle group surveillance effort and assignment of missions to the radar teams that best support this effort.

The steps necessary in formulating the radar surveillance plan are analysis of the terrain, assignment of priorities of importance to avenues of approach and critical points, and the selection of general site locations and sectors of coverage. The radar surveillance plan must be coordinated with the S3 in order to establish proper command relationship.

The radar section organic to the Infantry battle group provides the commander with a means of detecting, identifying and locating enemy targets in the area of influence and area of interest. It should be realized that with this new equipment we do not replace existing means for performing surveillance missions, such as listening posts, observation posts and patrols; but that we have added additional means which will improve our ability to perform our present missions.

The ultimate value of these new surveillance devices will be determined to a large extent by the realistic, timely and imaginative employment by the Infantry commander of all available surveillance devices in every type of tactical situation.

CHAPTER 3
WEAPONS DEPARTMENT PRESENTATION

Section I. MULTILITE SIGHT

CAPTAIN JOHN D. YARBROUGH

Instructor, Technique of Rifle Fire Committee, Weapons Department

The need for more effective fire with Infantry direct-fire weapons at night was demonstrated in night operations during the Korean War. It is a current Army position that, due to increased dispersion on the nuclear battlefield and to the need for commanders to mass and move their men under the maximum security and secrecy afforded by darkness, . . . "Future concepts and thoughts visualize that more and more operations will, of necessity, take place during the hours of darkness." The Multilite Aiming System was developed by the Weapons Department of the Infantry School in an effort to increase the night firing effectiveness of the Infantryman.

The difficulties encountered by the untrained soldier in attempting to deliver effective fire at night fall into two categories, target detection and aiming the weapon.

The difficulties involved in target detection are that the soldier has trouble locating his target and, when he does find it, it tends to fade or disappear. The mass of the soldier's weapon itself obstructs his field of vision and obscures the target. Muzzle flash momentarily blinds the firer if his weapon is not equipped with a flash hider. However, the soldier may be taught to use his eyes more effectively at night, thereby overcoming in part the difficulties of target detection.

The human eye is equipped to see in both daylight and darkness. Let's review the functioning of the eye (Figure 1). Light enters the eye through the pupil, the size of which is regulated by the iris acting as a diaphragm. Light passes through the lens and is focused on the rear of the eye, on that portion which we know as the retina. By electrical impulse, the image is transmitted to the brain and we "see." During periods of high illumination, light is focused on the cone region of the retina, so called because it is made up of some 7 million cone-shaped cells. The cone region we call our "day eyes"; it is sensitive to color and sharp contrast. This cone region is blind at night. Our "night eyes", the rod region, so called because it is made up of some 130 million rod-shaped cells, is sensitive only to black and white and shades of grey and it enables us to see during periods of low illumination. There is no sharp dividing line between the rod region and the cone region; the cells are intermingled where the two come together. The few rod cells mixed in with the cone cells enable the untrained soldier to see a target vaguely at first, but as he stares directly at the target, the rod cells become fatigued and the target disappears.

By applying the four principles of night vision, the soldier may use his eyes more effectively at night.

When the eyes are plunged into darkness, three things happen. The cone cells go blind, the pupil of the eye starts to expand in order to allow the maximum amount of available light to enter the eye, and the rod cells are sensitized by the build-up of a chemical compound called visual purple. In order for the soldier to be able to see at night, these three functions must take place. We call this the principle of Dark Adaptation. It takes thirty minutes for the average person to become dark adapted.

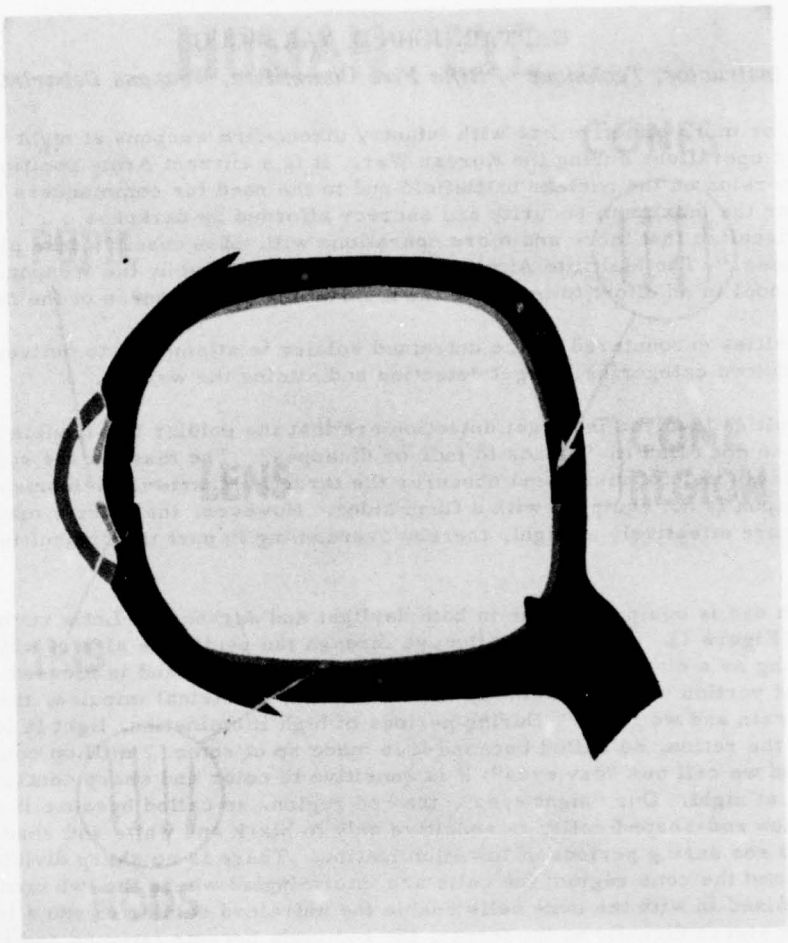

Figure 1. Diagram of the Human Eye.

The second principle of night vision is Off-Center Vision, which requires that the soldier look 6 to 10 degrees above, below, left or right, away from the object he wishes to observe while concentrating on the object. This focuses the image on the rod region. Off-center vision is like looking "out of the corner" of your eye.

The third principle is Scanning. Scanning is the short, jerky, abrupt movement of the eyes around an object or area we wish to observe. We scan in this manner for two reasons: the rod cells are sensitive to movement but will not see when in motion; and the visual purple in the rod cells bleaches out after four to ten seconds, and a new set of rod cells must be brought into use. We scan every four to ten seconds, and we apply scanning along with off-center vision.

The fourth principle of night vision is Confidence. By the application of the first three principles, the soldier gains confidence in his ability to see during the hours of darkness and begins to believe in his ability to operate effectively at night.

Under most conditions at night, standard weapons sights cannot be used. Therefore, without the use of special optical and infrared devices, aimed fire cannot be delivered. The most effective technique of night firing available to the Infantryman today is the pointing technique. The firer is told to apply the principles of night vision, to make maximum use of his eyes by keeping both eyes open, and to keep the head high, above the weapon, so that neither the weapon itself nor objects on the ground will obstruct his field of vision. He is taught to point his weapon at the target and to fire when he feels his weapon is aligned on the target.

The Multilite Aiming System provides the Infantryman with the capability of delivering aimed fire at night. As a part of a continuing effort to better the lot of the Infantry at night, we now present to you the Multilite Aiming System.

Primary among many essentials for an effective night aiming device is that at night, as in daylight, sights must be seen to be used and, when used, must not obscure the target or in any way obstruct the firer's field of vision.

As developed in prototype for the M1 rifle, the Multilite System furnished the rifleman with a dual-post, adjustable sight. This sight is adjustable for elevation and deflection because of the attachment of the rear post to the aperture of the standard rear sight (Figure 2). The sight will be an integral part of the weapon and when not in use, will not interfere with daytime use of the standard sight. The design of this sight has been approved by Ordnance and prototype models will be evaluated in the fall of 1959.

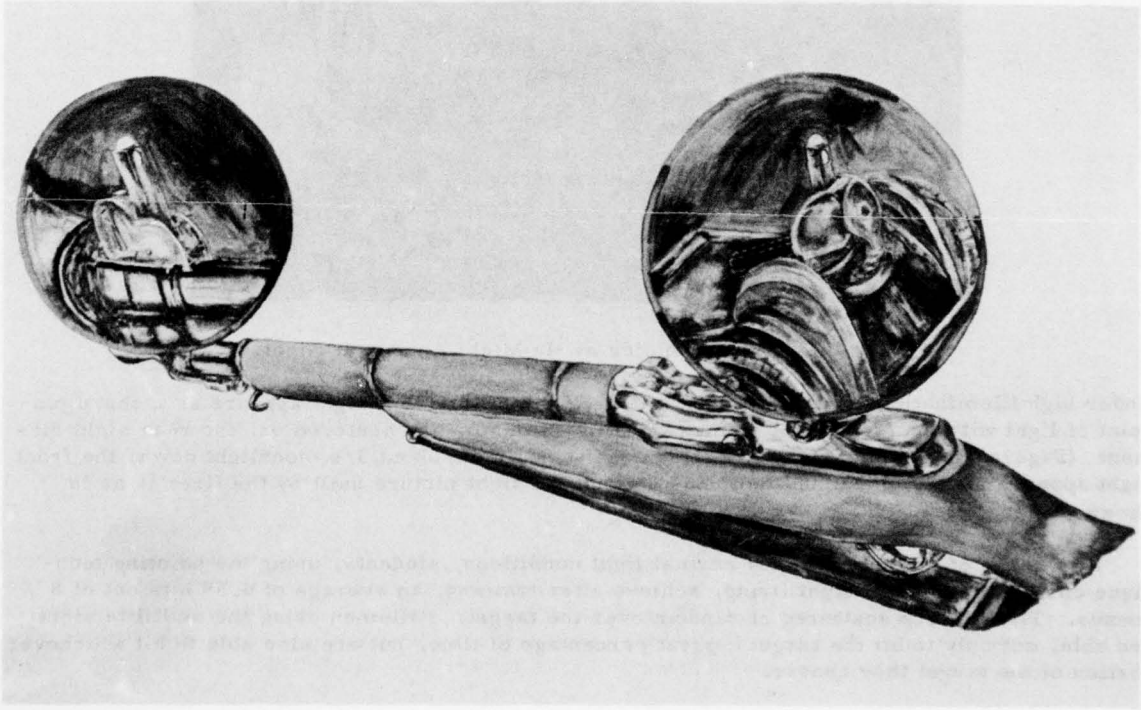

Figure 2. Multilite Sight Mounted on M1 Rifle.

Each post, front and rear, consists of two visible elements which are positioned sufficiently above the weapon so that the mass of the rifle does not obstruct the firer's field of vision or obscure the target. Each post is capped with a highly reflective, hemispherical surface, which reflects a pinpoint of light under high illumination. The high illumination element is not visible to the firer from about 3/4 moonlight down through the descending scale of illumination. During this time, a low illumination element, the radium luminous dot, is used. Light gathered and reflected on either set of elements is of such intensity that only one set of elements is visible to the firer at any time. This precludes any possible confusion as to which set of elements to use.

In order to use the sight, the firer, with both eyes open, first focuses his vision in the target area (Figure 3). At night, if he looks at his sights, he loses his target. Therefore, the firer must only be aware of his sights. Having determined the approximate center of mass of his target, the firer aligns the sights and builds his sight picture. The rear sight, being completely out of focus, appears as a round transparent haze when either the high or low illumination element is used (Figure 4). The front sight, being more nearly in focus, is well defined.

Figure 3. Enemy Soldier as He Might Appear at Night.

Under high illumination conditions, the reflective cap of the front sight appears as a sharp pinpoint of light with the front sight element resting on top of, and centered on, the rear sight element (Figure 5). Under low illumination conditions, from about 3/4 moonlight down, the front sight appears as a well-defined luminous dot and the sight picture built by the firer is as is shown (Figure 6).

At a range of 25 meters under normal light conditions, students, using the pointing technique currently taught in night firing, achieve after training, an average of 4.59 hits out of 8 rounds. The hits are scattered at random over the target. Riflemen using the multilite sight are able, not only to hit the target a great percentage of time, but are also able to hit whichever portion of the target they choose.

Figure 4. Round Transparent Haze Characteristic of Rear Sight Element.

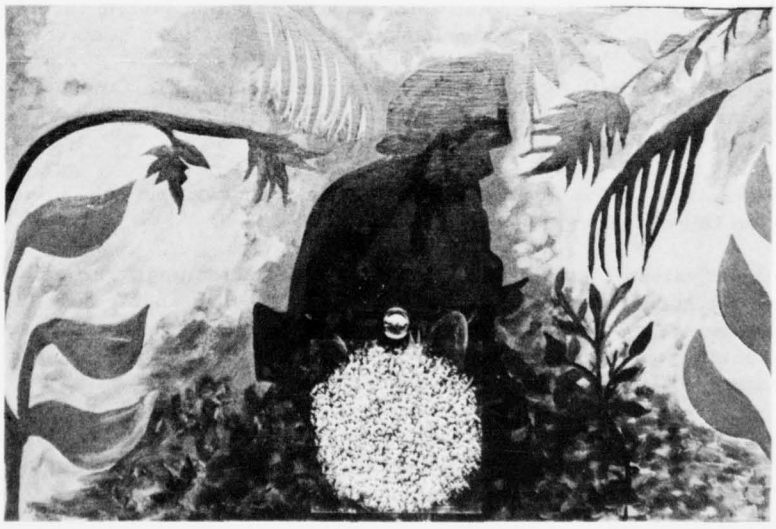

Figure 5. Appearance of Sight Picture Under Conditions of High Illumination.

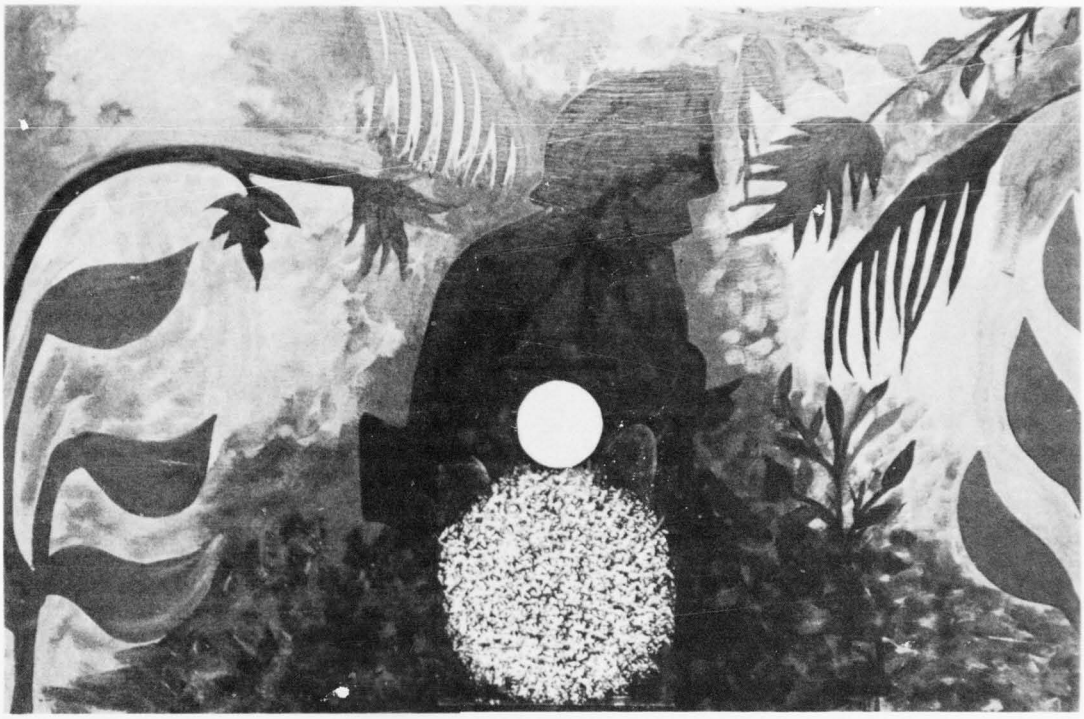

Figure 6. Appearance of Sight Picture Under Conditions of Low Illumination.

In addition to the M1 rifle, the Multilite System can be adapted to the automatic rifle, the light machinegun, the M60 machinegun and the 3.5-inch rocket launcher. Also it is readily adaptable to the M14 rifle. Multilite provides for accurate fire on visible targets at night up to the maximum effective range of all these weapons to which it has been adapted.

The principles of the Multilite System have been recommended for approval and adoption for general use in Infantry units by the Commandant, United States Army Infantry School and the Commanding General, Continental Army Command.

The Chief of Ordnance is conducting engineering tests and will produce pilot model sights for evaluation in the fall of this year.

Perhaps the most valuable capability of multilite-adapted automatic rifles and machineguns is the ability given the gunner to get initial burst hits on observed enemy automatic weapons at night. In a supplementary role, multilite can support the heavier, more expensive, and more sensitive target-seeking infrared equipment which might detect and designate targets not otherwise available to the miltilite-equipped rifleman.

Use of the Multilite System generates supreme confidence in the firer. Multilite will provide a great contribution to the night fighting capabilities of the Infantry.

Section II. LATEST DEVELOPMENTS RELATING TO THE M60 MACHINEGUN

CAPTAIN BENJAMIN F. IVEY, JR.

Instructor, Machinegun Committee, Weapons Department

In the first portion of this presentation we will discuss three areas of importance which effect the machineguns of the Infantry battle group. The first topic that will be discussed is the status of the tripod mount for the machinegun, 7.62mm, M60. This will be followed by a discussion of a proposed training program for machinegunners, and finally we will bring you up to date on the status of ammunition packaging for the machineguns.

During the 1958 Infantry Instructors' Conference we told you that the tripod mount M91, which was originally developed for the machinegun, M60, was unsatisfactory for use within the rifle platoons of the Infantry battle group and that the U.S. Army Infantry School has recommended the suspension of the M91 mount and the subsequent adoption of the modified M2 mount as a mount for the M60. Since last year's conference, the Army has suspended production of the M91 mount.

PINLESS MOUNTING SYSTEM FOR MODIFIED M2 MOUNT

One of the major disadvantages of the modified M2 mount shown last year was the difficulty encountered during the mounting and dismounting of the gun. In December 1958, the Weapons Department recommended that a pinless mounting system be incorporated with the modified M2 mount. The U. S. Army Infantry School position is that a modified M2 mount with a pinless mounting system should be adopted as the standard mount for the machinegun, 7.62mm, M60. The modified M2 mount with the pinless mounting system, shown to you at the 1959 conference by the U. S. Army Infantry Board, is the latest development and incorporates all of the Infantry School's recommendations pertaining to the mount (Figure 7).

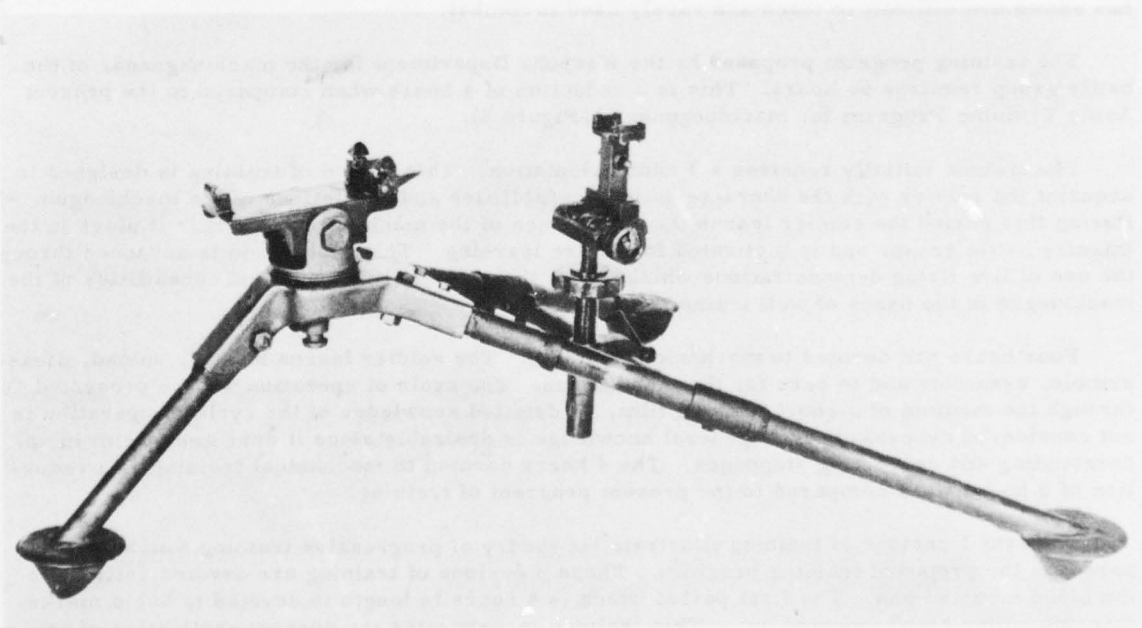

Figure 7. Proposed Pinless Adapter Which Permits Mounting of the M60 Machinegun on the M2 Tripod.

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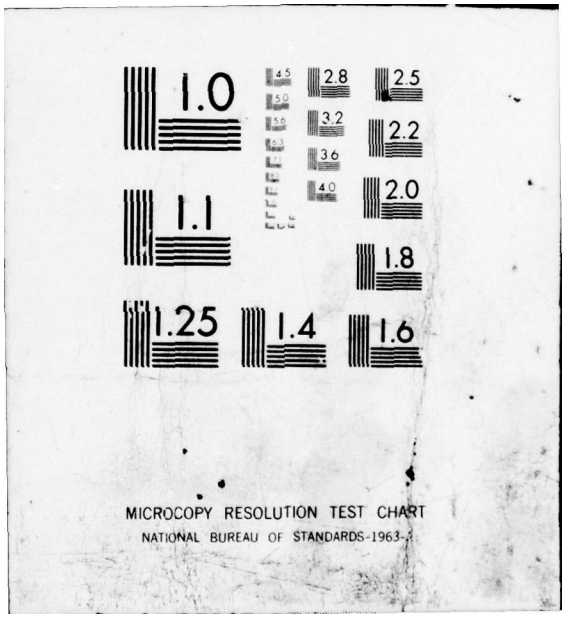
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MACHINEGUN TRAINING PROGRAM

Since the end of World War II the United States Army has made great forward strides in the field of weapons and equipment for the fighting Infantryman. These changes were necessitated by the advent of the nuclear battlefield. The firepower available to the "Doughboy" today is unexcelled by any nation. In order to insure that the Infantryman realizes the full potential of these weapons, we must give him the best possible training in the shortest possible time.

Many theories relative to marksmanship training have been advanced in recent years. Perhaps the most significant of these are the Trainfire and Autofire concepts. Basically, these concepts tend to eliminate the artificial training practices inherent in known distance ranges and, in turn, place greater emphasis on realism during weapons training.

The reorganization of the Infantry under the ROCID concept and the almost simultaneous adoption of the machinegun, 7.62mm, M60, resulted in a re-evaluation of the present methods of teaching machinegun marksmanship.

The resulting study revealed several significant facts. First, that machinegun training must continue to be directed toward producing machinegunners who can effectively engage and maintain fire upon combat targets. Secondly, that the present 12.7-meter firing incorporates several artificial aspects which are unrealistic and do not contribute greatly to the desired end product of training. Another significant weakness inherent in the present machinegun training program is the allocation of time and ammunition to the technique of fire training. This phase of the machinegunner's training represents the end product of training since it develops the individual and team skills required to engage combat targets.

The training program which we will discuss with you is designed to overcome these and other deficiencies. It is to be remembered that this program is designed primarily for the machinegun, 7.62mm, M60, and includes some new techniques which are permitted by the characteristics of the gun. Additionally, it eliminates some of the obsolete skills which experience has shown are difficult to teach and rarely used in combat.

The training program proposed by the Weapons Department for the machinegunner of the battle group requires 66 hours. This is a reduction of 4 hours when compared to the present Army Training Program for machinegunners (Figure 8).

The trainee initially receives a 1 hour orientation. This period of training is designed to acquaint the soldier with the characteristics, capabilities and limitations of the machinegun. During this period the soldier learns the importance of the machinegun, the role it plays in the Infantry battle group, and is motivated for future learning. This motivation is advanced through the use of live firing demonstrations which shows the soldier the effects and capabilities of the machinegun in the hands of well trained gun crews.

Four hours are devoted to mechanical training. The soldier learns to load, unload, disassemble, assemble and to care for the machinegun. The cycle of operation will be presented through the medium of a short training film. A detailed knowledge of the cycle of operation is not considered necessary; but a general knowledge is desirable since it does assist him in understanding and correcting stoppages. The 4 hours devoted to mechanical training is a reduction of 5 hours when compared to the present program of training.

The next 3 periods of training illustrate the theory of progressive training which is inherent in the proposed training program. These 3 periods of training are devoted entirely to the bipod mounted gun. The first period which is 4 hours in length is devoted to basic marksmanship with a bipod mounted gun. This training incorporates the correct application of basic fundamentals taught with other weapons which are applicable to the machinegun. During this

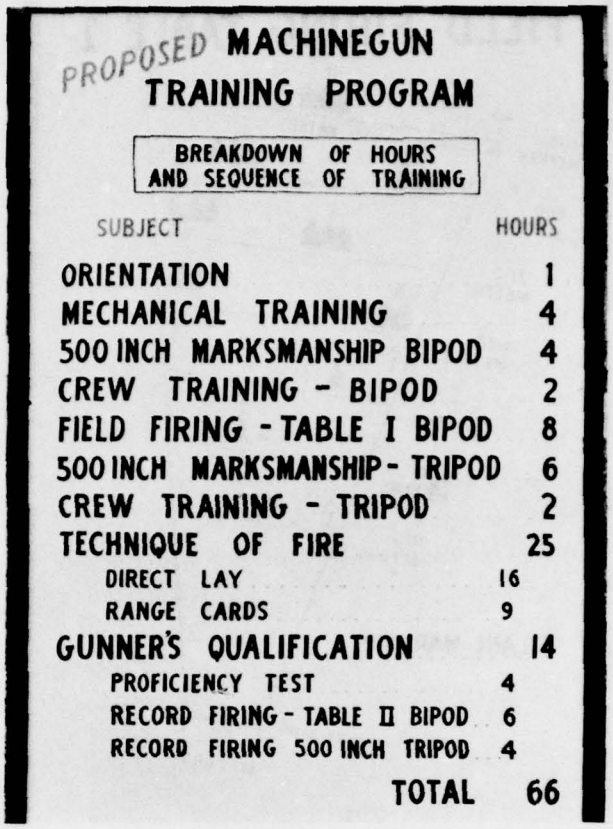


Figure 8. Proposed Machinegun Training Program.

training the soldier is taught the basic principles of marksmanship which includes sight alignment and sight picture, sight setting and laying and the correct gunner's position. He fires a live firing exercise using 54 rounds of ammunition on a 12.7-meter range at a landscape type target.

Following the 4 hours on the 12.7-meter range with the bipod mounted gun is a 2 hour period of bipod crew training. This training familiarizes the soldier with the duties of each of the crew members and trains him in a systematic method of examining the gun, placing the gun into action and taking the gun out of action. Proficiency in crew training is attained through the integration of crew training into subsequent training.

The next 8 hours is devoted to instructional firing of Table I. This firing is comparable to the present transition range. This training incorporates crew training and is fired with a bipod mounted gun. The soldier is required to engage point targets which appear at ranges between 300 and 900 meters. This requires an application of target detection and range determination techniques taught during Trainfire and Autofire and trains the soldier in engagement of targets, fire adjustment and fire distribution as it applies to a machinegun.

A range envisioned for this training consists of 12 lanes which are 10 meters wide at the firing point and 90 meters wide at the maximum range (Figure 9). The range uses electrical target devices which eliminate the use of soldier pit details. These devices are available now and have been recommended for use on our present machinegun transition ranges. The adoption

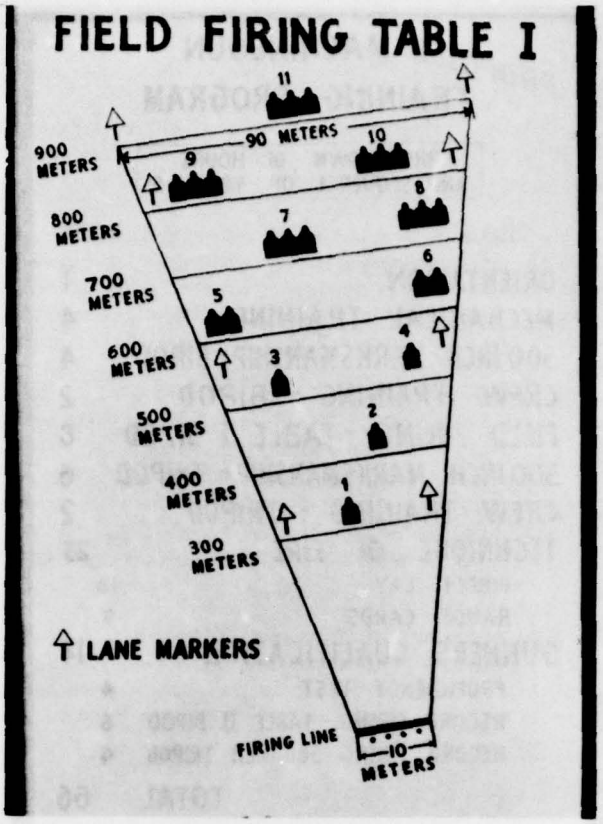


Figure 9. Table I Field Firing Range.

of Table I does not establish a new terrain requirement. In fact, a salient feature of the proposed training program is that it takes full advantage of existing ranges, thereby keeping the cost of the implementation of this program to the absolute minimum. Present transition ranges can be modified to accommodate Table I. Each trainee will be allocated 183 rounds of ammunition during this phase of training.

Since this range cannot accommodate a full 200-man company on the firing line at one time, it affords an opportunity to conduct concurrent training. This concurrent training includes additional training in disassembly and assembly, stoppages, malfunctions and immediate action. This insures maximum use of training time and increases the soldier's proficiency in mechanical training.

With the exception of the mechanical training period, all training has been done with a bipod mounted gun. At this time the training progresses to the tripod mounted gun. Initially, the soldier is taught basic marksmanship with a tripod mounted gun. The principles and techniques learned during bipod training are carried forward, and the additional skill of gun manipulation is introduced. The gunner learns the direction of manipulation and how far each manipulation moves the center of impact of the beaten zone. The preparatory marksmanship portion of this 6 hours may be taught on the machinegun square or on the 12.7-meter range. The firing portion of this training is done on the 12.7-meter range and is accomplished on a landscape-type target. The soldier fires two exercises using a total of 264 rounds of ammunition. This firing is used to detect errors in the application of the fundamentals of basic marksmanship and skill in manipulation. The principles of engagement of targets taught during this training are designed to

support technique of fire instruction. This tends to eliminate some of the unrealistic aspects of this type of training which is inherent in the present 12.7-meter range firing.

The 2 hour period devoted to tripod crew training teaches those skills required for examining the equipment used with a tripod mounted gun, placing the gun into action and taking the gun out of action. This training is incorporated into future technique of fire training.

The time devoted to technique of fire has been increased by only 2 hours. However, a reallocation of this time and the deletion of position defilade and overhead fire permits greater emphasis on the direct lay portion of this subject. An appreciable increase has been made in the amount of ammunition fired during this phase. The time devoted to the preparation of range cards has been reduced by 1 hour and now includes a 3 hour night application phase.

The machinegun, M60, permits the use of a magazine and is consequently ideal for hip and shoulder firing when the situation permits. This type of firing will be included during the technique of fire portion of the training. This training is limited to the skill of firing from these positions and does not require a special range requirement. The range facilities required for all phases of technique of fire training are the same as those used today. Any suitable field firing range with a target complex consisting of silhouettes, barrels or old tank hulls will be adequate for this training. A total of 1050 rounds of ammunition is allocated per trainee for technique of fire training.

Gunners' Qualification is receiving the emphasis that it has long required, but failed to receive. In the present training program the gunner fires for qualification prior to receiving his technique of fire training. In essence, he is tested on basic marksmanship only. Gunners' Qualification under the new training program is to be administered in 3 phases, and it requires 14 hours to administer the entire test.

The first 4 hours are devoted to a proficiency test which covers all phases of the training program which cannot be adequately tested by range firing. It is a practical work type examination and represents 40% of the gunners' qualification score.

Record firing for qualification is divided into 2 phases. The first record firing to be accomplished is called Table II. The Table II Record Range (Figure 10) is superimposed on a Table I range and is fired with a bipod mounted gun. The gunner is required to engage point targets and targets which have width and depth. This is in essence a culmination of all training accomplished during basic marksmanship and technique of fire. This firing represents 30% of the gunners' qualification score.

The second portion of the record firing is accomplished on a 12.7-meter range and is fired with a tripod mounted gun using a new landscape target (Figure 11). It is designed to test the gunners' ability to engage targets which have width and depth, thereby requiring manipulation skill and a knowledge of fire distribution and fire adjustment. It requires the correct application of the basic fundamentals taught in technique of fire instruction. This firing also represents 30% of the gunners' qualification score.

In order for a soldier to qualify as a machinegunner, he must demonstrate proficiency in all phases of the test. A scaling system will be used to determine the various degrees of qualification.

This proposed training program for the machinegun, 7.62mm, M60, reduces the amount of training time required to train a machinegunner by 4 hours. It also eliminates many of the artificial practices found in the present program. This is in evidence by the fact that the 12.7-meter training will more closely support the technique of fire training. The sequence of training contained in the proposed training program satisfies the requirement for progressive training and

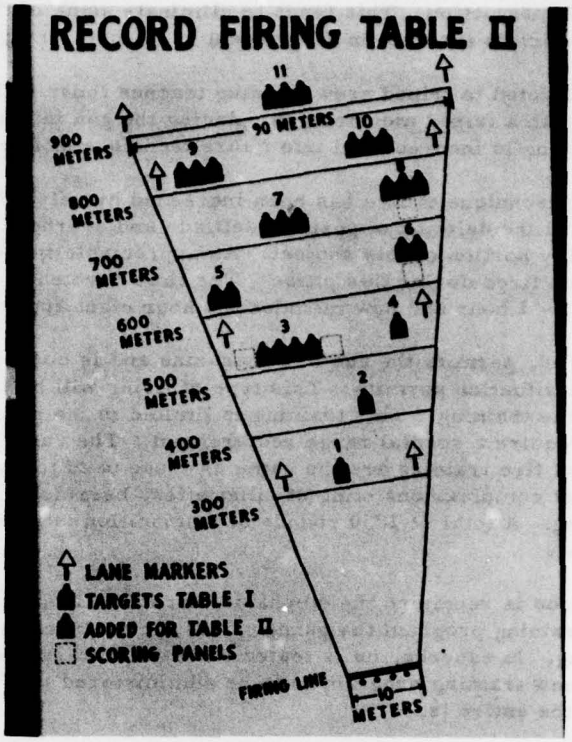


Figure 10. Table II Record Firing Range.

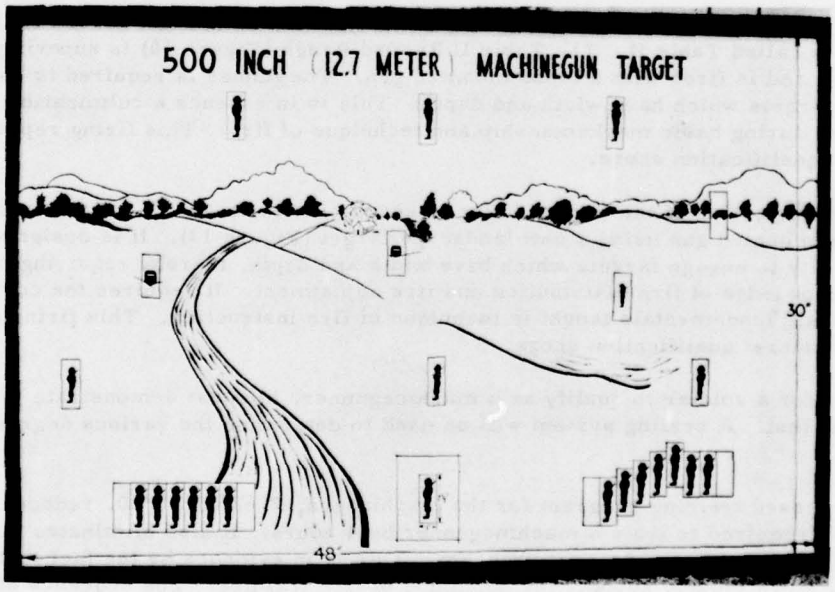


Figure 11. Proposed New Landscape Target.

maintains the "simple to the complex" concept of training. The training sequence permits immediate application of skills through integration into subsequent training. Maximum utilization is made of all training time by the use of concurrent training where applicable. Maximum use is made of existing range facilities to keep the cost of implementing this program to a minimum. The use of electrical target devices is restricted to those ranges which have a definite requirement for them and where the use of such devices will materially increase the effectiveness of the training. The amount of ammunition fired by each trainee is increased from a mere 881 rounds to 1959 rounds. This will result in increased proficiency and more effective machinegun fire during combat.

AMMUNITION PACKAGING

The U. S. Army Infantry School has always advocated reducing the weight of the combat load of the individual Infantryman. The adoption of the machinegun, 7.62mm, M60, was a step toward this end. The manner in which the ammunition for the M60 will be packaged will also reduce the load of the Infantryman.

The Infantry School has recommended that the 7.62mm machinegun ammunition be packaged in a disposable cardboard carton (Figure 12). This, in turn, will be covered by a cloth bandoleer equipped with a shoulder strap. The entire unit is called the T-4 bandoleer. The T-4 holds 100 rounds of linked ammunition and weighs 7 pounds fully loaded.

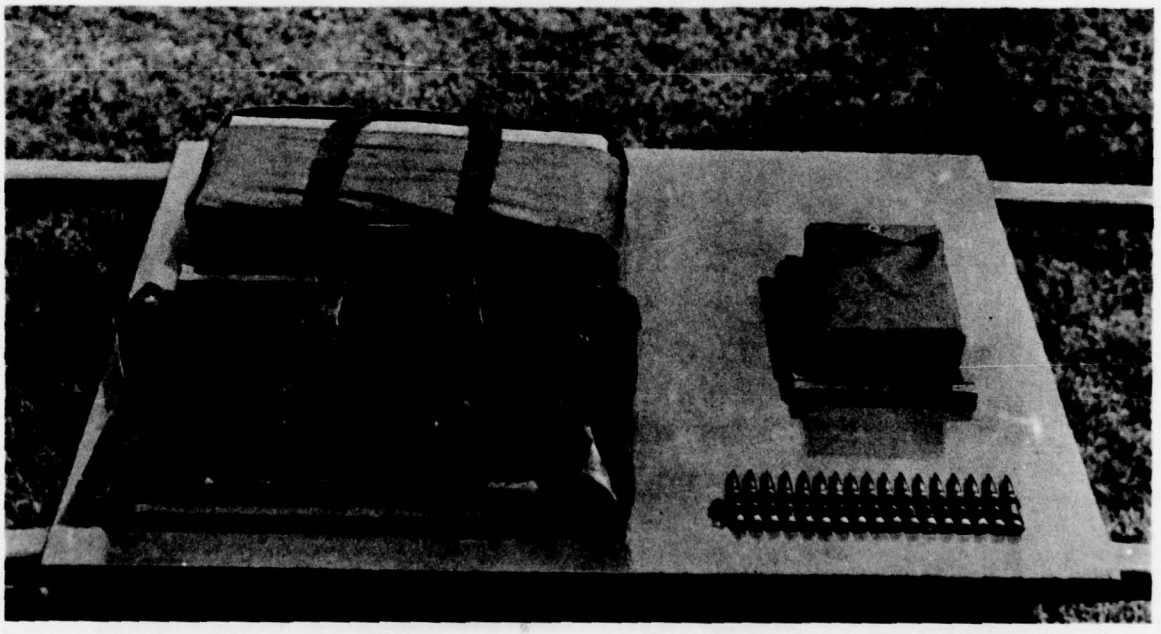


Figure 12. Machinegun Ammunition Packaging -- T-4 Bandoleer on Right.

Three bandoleers will be packaged in a waterproof plastic covered carrier. The bandoleers will be arranged within the carrier so that they may be joined together and fired from the carrier as one belt. This will be the normal method for firing with the bandoleer system.

This method of packaging is designed for frontline Infantry use. The ammunition will be packed by the arsenals for shipment and storage in airtight steel boxes holding six bandoleers. The company will receive their machinegun ammunition in this container. When distribution to platoon level is required the ammunition will be removed from the steel boxes and sent to the platoons in the plastic carriers. This restricts the weight to those areas which are equipped to handle it and keeps the weight of the ammunition and the carrier to a minimum at platoon levels.

The adoption of the bandoleer system for machinegun ammunition will eliminate the 4-pound ammunition can in use today. It will also increase the ammunition carrying capability of the machinegun crew. The amount of ammunition that can be carried presently is restricted by the size of the crew, the weight of the equipment and by the use of the metal ammunition can. The T-4 bandoleer permits the ammunition to be broken down into individual 7-pound loads and distributed throughout the crew. The crew member carries the ammunition over his shoulder by using the shoulder strap which allows him to keep his hands free for other equipment.

CANVAS MAGAZINE

A canvas magazine has also been developed and recommended for adoption (Figure 13). This will permit the realization of the full potential of the M60. Due to the weight of the M60

Figure 13. M60 Machinegun with Canvas Magazine.

and the fact that it is gas operated, the M60 can be effectively fired from the shoulder and from the hip. This makes available to the Infantry a machinegun which is capable of joining the assault on an objective.

The canvas magazine is attached to a magazine bracket located on the left side of the receiver. The T-4 bandoleer fits into the canvas magazine without repacking. The use of the magazine facilitates shoulder and hip firing by eliminating the need for the immediate assistance of another crew member at the gun. The magazine is an accessory for the gun, and its use will be restricted to special operations and will not be the normal method for firing.

The machinegun still remains the only supporting weapon under the direct control of the rifle platoon leader which can provide him with a close and continuous volume of fire so essential to the rifleman. The modified M2 mount provides a stable tripod thus insuring effective employment of the machinegun, M60, in the predetermined fire role. The adoption of the proposed training program will insure that the machinegunners are prepared for combat. The T-4 ammunition packaging system will increase the ammunition carrying capability of the machinegun crew and will reduce the weight-load of the individual Infantryman, thereby making him more effective in combat. The use of the canvas magazine adds to the flexibility of the machinegun and permits the realization of the full potential of the M60.

The machinegun, 7.62mm, M60, in the hands of well trained troops, is a deadly, efficient weapon. It is a welcome addition to our arsenal.

Section III. VEHICULAR-MOUNTED MINE DETECTOR AND INCENDIARY BURSTER, M4

CAPTAIN GEORGE L. ROBSON

Instructor, Special Purpose Weapons Committee, Weapons Department

VEHICULAR-MOUNTED MINE DETECTOR

There are two ends to every weapon, the "giving end" and the "receiving end." The technical term for an Infantryman on the receiving end of most weapons is a "target." On the receiving end of a mine, however, he is always a "victim." The land mine is a silent, invisible weapon which strikes and destroys in an instant. It must be found before it finds a victim, and, on many occasions, speed in locating the mine is of the essence. Until recently, the Infantryman had to probe, or at best, depend on the slow pace of the hand carried electric mine detector. Something has long been needed to enable him to sweep a road or a minefield at a pace in keeping with modern warfare. A vehicular mounted detector seemed to be the answer, and now at last we have it. The AN/VRS-2 mine detector is mounted on a 1/4-ton truck (Figure 14).

The AN/VRS-2 mine detector will be issued as a kit which troops in the field can easily mount on the 1/4-ton truck. This kit weighs about 760 pounds and is a Signal Corps supply item. Although the AN/VRS-2 has been classified as standard, no definite production schedule has been established.

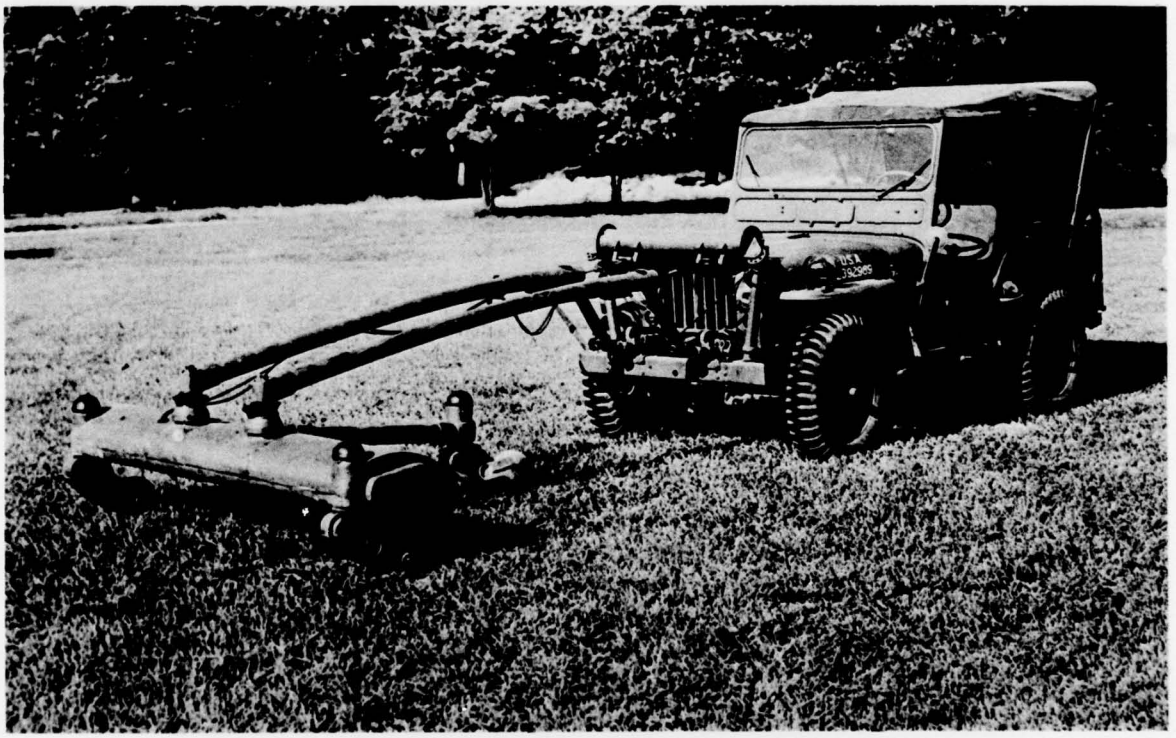


Figure 14. AN/VRS-2 Mine Detector Mounted on 1/4-Ton Truck

This is how the mine detector works: when the search head moves to a position where any part of it is over a metallic object, electric coils in the search head are thrown out of balance.

When these electric coils are thrown out of balance, the resultant surge of electric power causes a humming sound in the driver's headset and fires a hydraulic piston. The hydraulic piston automatically declutches the vehicle, applies the brakes, and freezes the gear used to steer the search head to the right and left.

The detector's safest speed of operation is about 2 to 3 miles per hour. In an emergency, with good brakes and a good braking surface, the jeep could move as fast as 10 miles per hour. Let us now examine the method of operating the detector. A buried metallic object under the mine detector search head stops the jeep. The driver now steers the search head as far to the right as it will go. He then recocks the hydraulic piston and steers the search head back to its orginial position. When the left edge of the search head passes over the metallic object, the hydraulic piston fires again and freezes the steering gear. The driver now knows that a metallic object of some sort is located directly beneath the left edge of the search head. A prober then moves forward to examine the metallic object which the driver has pinpointed for him. He finds that the object is a mine. The prober uncovers it and marks it.

The best this jeep mounted mine detector can do is find a metallic object. A prober has to be riding along to find out if it is actually a mine. If it is a mine, he marks it for removal or destruction.

Do not sell this detector short. Although it cannot find entirely nonmetallic mines, it represents a great improvement in our ability to rapidly locate all other types of mine, and although it may appear slow, the AN/VRS-2 can locate mines at about 40 times the speed of hand carried detectors.

INCENDIARY BURSTER, M4

Besides the land mine, we have another nasty weapon for you to consider--flame. There are few weapons which have the psychological effect of fire and flame. In Biblical times, destruction by fire from Heaven was reserved for those who deserved to die in the worst possible way. Soldiers who fearlessly faced spears and arrows wavered and fled in the face of flame. Yet, until March 1959, when the M4 incendiary burster was standardized, the Infantryman had to improvise explosive devices to scatter and ignite thickened fuel. The M4 incendiary burster is effective, safe, reliable and easy to use. As infantry instructors, you will be interested in the characteristics and capabilities of this weapon.

The M4 incendiary burster is shown in (Figure 15). The burster is a Chemical Corps class V supply item. It weighs a little over 2 pounds. It is about 12 inches long and 1 1/2 inches in diameter. Inside the metal outer tube, which you see in the illustration, are two concentric plastic cylinders. The inner cylinder contains an explosive which scatters and ignites a pyrotechnic ignition mixture in the outer cylinder. The plastic cylinders are sealed and should not be tampered with. In one end of the burster is a detonator well.

When you are ready to use this burster, first remove the shipping plug and then insert a detonator the size of an ordnance blasting cap in the detonator well. If you want to increase the size and effect of the M4 incendiary burster, just join two or more of them together end to end. One burster will scatter and ignite 5 gallons of thickened fuel.

Wrap a rag around the shoulder of the burster tube on the same end as the detonator well. Push the burster, detonator well up, through the mouth of the thickened fuel container. The rag should seal the opening and wedge the burster solidly in the container. If rags are not available, you can use adhesive tape or mud to seal the opening around the burster. Now put the burster in its firing position. Notice where the burster is located. You get the best effect when the burster is beneath the greatest volume of fuel.

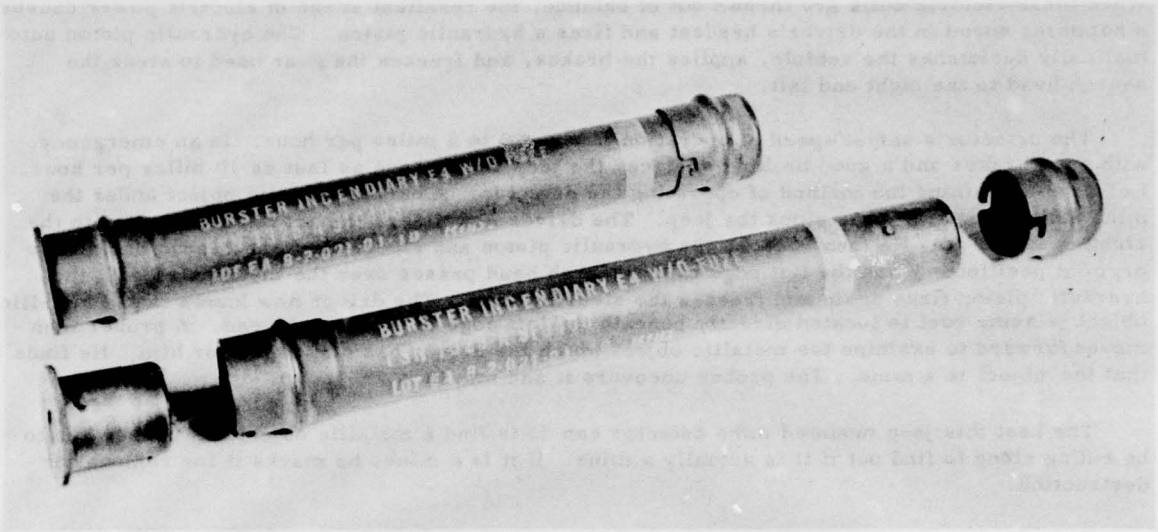


Figure 15. Incendiary Burster, M4

Next, you install the firing system. Since the M4 incendiary burster is issued without firing devices or detonators, you have a choice of firing systems. Depending upon your specific needs, the firing system can be either controlled or victim-actuated, multiple or single, electric or nonelectric. For example, after very little training, any Infantryman can install and operate a firing system consisting of a battery, a short length of communication wire, and an electric blasting cap. A five-gallon can of thickened fuel ignited by one burster will cover a circular area approximately ten meters in diameter.

The infantryman could use something like that a few meters in front of his foxhole to help break up an enemy assault. The platoon leader or company commander may desire something more substantial in front of his observation post. A 55-gallon drum of thickened fuel, scattered and ignited by 2 bursters, will cover an area approximately 55 meters in diameter and will give any enemy a warm welcome.

If the recommendations of the Infantry School are approved, the incendiary burster, M4, will be carried in the battle group's basic load of ammunition. The Infantryman can then take immediate advantage of any opportunity to employ flame against the enemy.

Section IV. SS-10 AND SS-11 ANTITANK GUIDED MISSILES

FIRST LIEUTENANT CHARLES B. ALLEN

Instructor, Missile Committee, Weapons Department

The United States Army has a requirement for an Infantry antitank weapon which will increase the maximum effective range of our antitank ground defense while still maintaining our first round probability of kill. Other NATO nations have also realized the necessity for such a weapons system. One of the most prominent of these nations is the French, who started development of a guided missile system in 1945. In 1952 the United States Army, realizing its requirement for such a system, established the military characteristics which started work on the Dart guided missile program. At the same time, in accordance with the NATO nations' agreements on the interchange of weapons, a United States Army Ordnance-Marine Corps-Navy team visited France to observe and study the French system. As a result of this visit, missiles and associated equipment were procured from the French for tests in the United States. The tests were conducted in 1953 at Aberdeen Proving Ground, Maryland, Fort Benning, Georgia, and Quantico, Virginia. These tests revealed numerous deficiencies and OCAFF, now USCONARC, concluded that the system was not compatible with our requirements. However, the French continued to make modifications in their missile system. From 1954 through the early part of 1956, the French Army used the system extensively in the Algerian fighting. This combat testing of the missile instigated many changes which corrected deficiencies noted in our initial tests. In June 1957, another group of United States Army personnel visited France to further study and observe their missile system. This group decided that it was a simple, reliable and relatively inexpensive system that could be readily incorporated into present organization and training structures and recommended that the missile be re-evaluated with a view for possible adoption as an interim antitank guided missile. Department of the Army authorized procurement of missiles and equipment in November 1957 and approved the conducting of a User Service Test by USCONARC in the United States. In connection with this program, a group of United States Army and Marine Corps personnel was sent to France during the period March - April 1958 to receive training in the operation and maintenance of the system. Conduct of the User Service Test was begun at Fort Bliss, Texas, on 30 June 1958 and was completed by 15 August of the same year. Results of the test were most favorable, concluding that the missile was the best antitank guided missile tested to date and that it was suitable for United States Army use. Based on this conclusion, the Dart antitank missile system, still in development stages, was deemed too complex and the program was terminated.

The missile shown in Figure 16 is the SS-10 antitank guided missile which was recently accepted for use by the United States Army. Its initials S-S stand for Sol-Sol or ground-to-ground missile and 10 is the classification number given to it by the French manufacturer. The SS-10 is a light, self-propelled, remote controlled guided missile designed primarily to deliver accurate and lethal fire against tanks and other armored vehicles. Because of its accuracy, it may be assigned a secondary mission of firing against roadblocks and fortifications. For these purposes, the SS-10 can be equipped with any one of three interchangeable combat type warheads; a 105mm shaped-charge (HEAT) warhead for use against heavy tanks, an 85mm combination shaped-charge, fragmentation, antipersonnel warhead for use against tanks with accompanying Infantry, and a 114mm antipersonnel chemical warhead containing tear gas. In addition to these three types, it may also be equipped with an inert warhead. Any one of these warheads can be delivered to a minimum practical range of 450 meters and a maximum practical range of 1600 meters. The missile at rest on its zero length launcher has a total weight of 33 pounds, a length of 34 inches, a wing span of 29.5 inches and body diameter of 6.5 inches. Located on the rear of the missile is a pyrotechnic flare which aids the gunner in tracking the missile to the target.

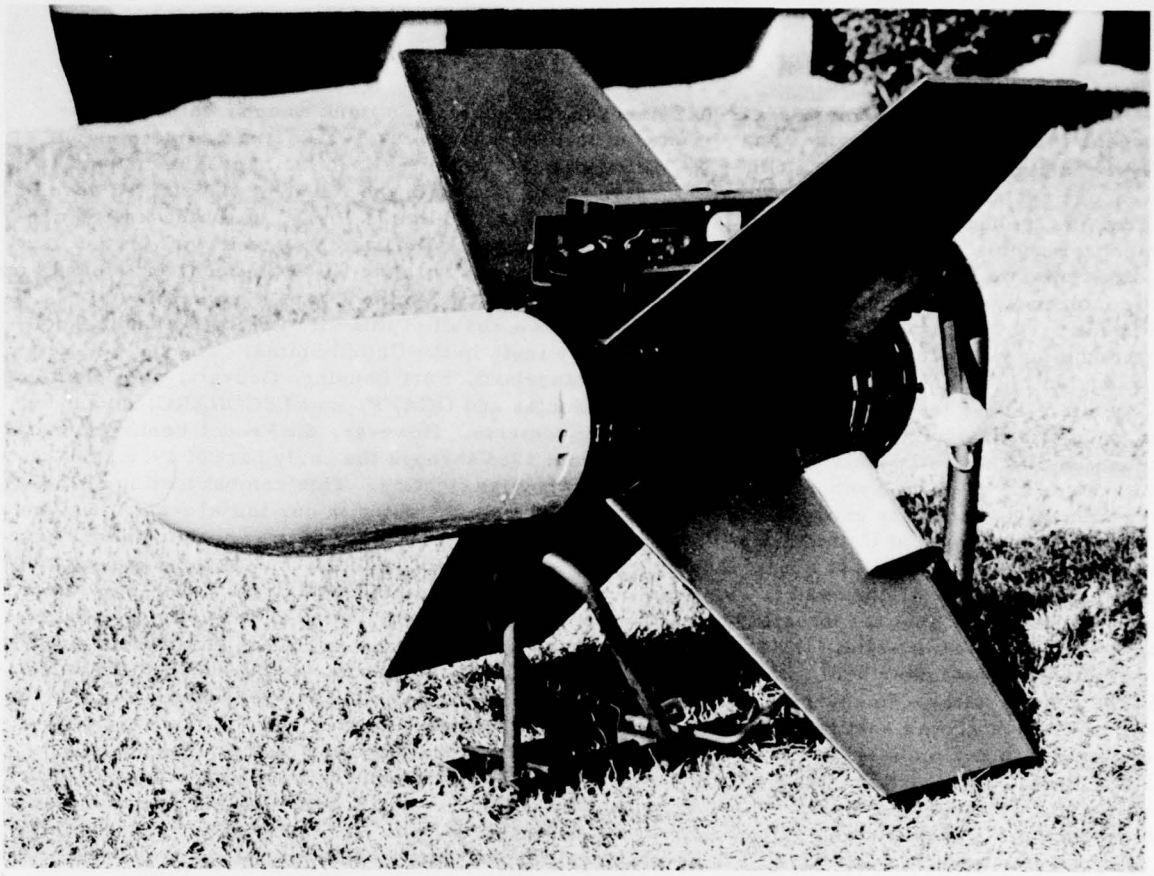


Figure 16. SS-10 Missile on Zero Length Launcher.

The missile is propelled by a two-stage solid propellant rocket comprised of a booster and a sustainer motor. The booster motor launches and accelerates the missile to its required velocity of 80 meters per second or approximately 180 miles per hour. It contains a highly combustible powder which has a total burning time of .65 of a second. After the booster motor has burned for .3 of a second, the sustainer motor is ignited and maintains the required velocity obtained by the booster motor throughout the remainder of the missile's flight to the target. The total burning time of this motor is 17 seconds.

Approximately 3.5 seconds after ignition of the sustainer motor, the fuze-detonator assembly is armed, and on impact the detonator is fired by inertia causing the warhead to explode.

The fins are set on an angle to the missile body and the forward motion causes the missile to rotate from 1 to 2 revolutions per second in flight. Located on the rear of each fin is a remote controlled spoiler. Each one consists of a plastic housing and a thin metal blade. These blades are the controlling surfaces for each fin when the missile is in flight. The spoiler blades require a 24-volt power supply which is furnished by two 12-volt batteries inserted in the missile body prior to assembling the missile for firing. During flight, the position of these

blades is controlled by electrical signals which are generated by a gunner operating a single manual control stick. The control stick is mounted vertically and oriented so that a backward or forward movement directs the missile up or down, and a left or right movement directs the missile left or right. These commands are transmitted through the control cable to the signal generator which is the nerve center of the guidance equipment. The signal generator changes the guidance commands into electrical signals and transmits them through the selector cable to the selector box. The selector box, which contains a series of relays, permits the simultaneous connection and individual launching of six missiles. From the selector box the signals go through the missile cable to the zero length launcher and out over the guidance wires to the missile in flight. By manufacturer's specifications, there is 1650 meters (+ or - 50 meters) of guidance wire contained on two bobbins within the missile body. The acceptance tolerance of + or - 50 meters accounts for our maximum effective range and our maximum practical range. We can better understand this by discussing our operational zone of action (Figure 17).

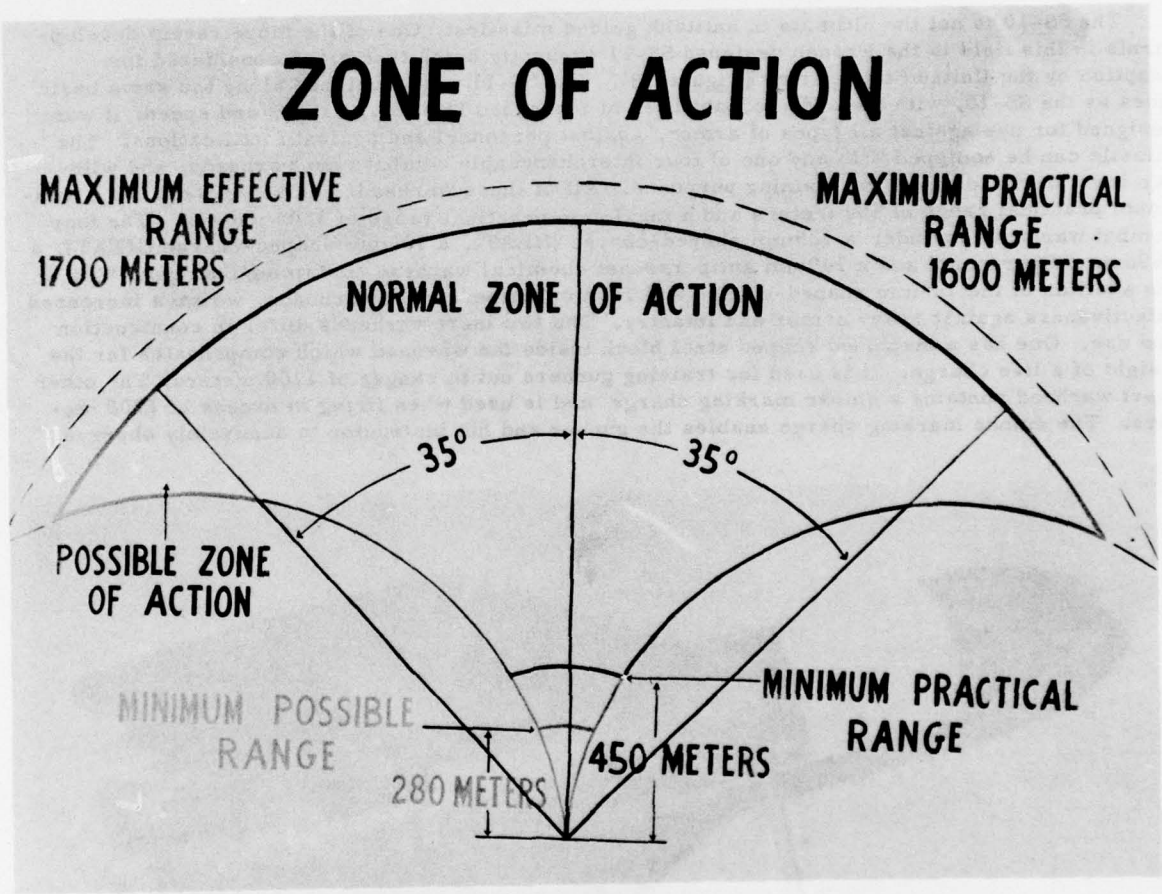


Figure 17. Operational Zone of Action, SS-10.

The maximum effective range of 1700 meters is shown by the dotted line at the top of the chart. It is established by adding the 50 meter tolerance of guidance wire. Directly below the dotted line is the 1600 meter line showing the maximum practical range which is established by subtracting the 50 meter tolerance of guidance wire. To insure that all targets are within the

range capabilities of the SS-10, we use the maximum practical range when planning our fires. It is possible to engage targets out to the maximum effective range, but due to the acceptance tolerance in guidance wire, the reliability of the missile cannot be assured beyond 1600 meters.

Moving down to the bottom of the chart, you will see the minimum practical range and the minimum possible range. The minimum possible range is determined by the 3.5 second delay prior to the arming of the fuze-detonator assembly which arms the warhead. During this period of time, the missile will travel 280 meters from the launching site. At any distance beyond 280 meters, the warhead will be armed and will explode on impact. The minimum practical range of 450 meters is determined by the amount of time it takes a gunner to align and stabilize the missile on the target. The normal zone of action extends 35° to the left and right of the launching azimuth. It is possible to hit a target outside this area, as indicated by the possible zone outlined in red. However, due to the complications in engaging a target in this area, we do not plan fires outside the normal zone of action.

The SS-10 is not the ultimate in antitank guided missiles. One of the more recent developments in this field is the French designed SS-11 presently being tested and considered for adoption by the United States Army (Figure 18). The SS-11 was developed along the same basic lines as the SS-10, with the added capabilities of increased lethality, range, and speed. It was designed for use against all types of armor, against personnel and against fortifications. The missile can be equipped with any one of four interchangeable combat type warheads, and with two inert warheads used for training purposes. All of these warheads can be delivered to a minimum practical range of 500 meters and a maximum practical range of 3500 meters. The four combat warheads include: a 125mm shaped-charge (HEAT), a 105mm shaped-charge (HEAT), a 140mm antipersonnel and a 140mm antipersonnel chemical warhead containing tear gas. With the addition of the 125mm shaped-charge and 140mm antipersonnel warheads, we have increased effectiveness against heavy armor and Infantry. The two inert warheads differ in construction and use. One has a machined shaped steel block inside the warhead which compensates for the weight of a live charge. It is used for training gunners out to ranges of 1700 meters. The other inert warhead contains a smoke marking charge and is used when firing in excess of 1700 meters. The smoke marking charge enables the gunner and his instructor to accurately observe

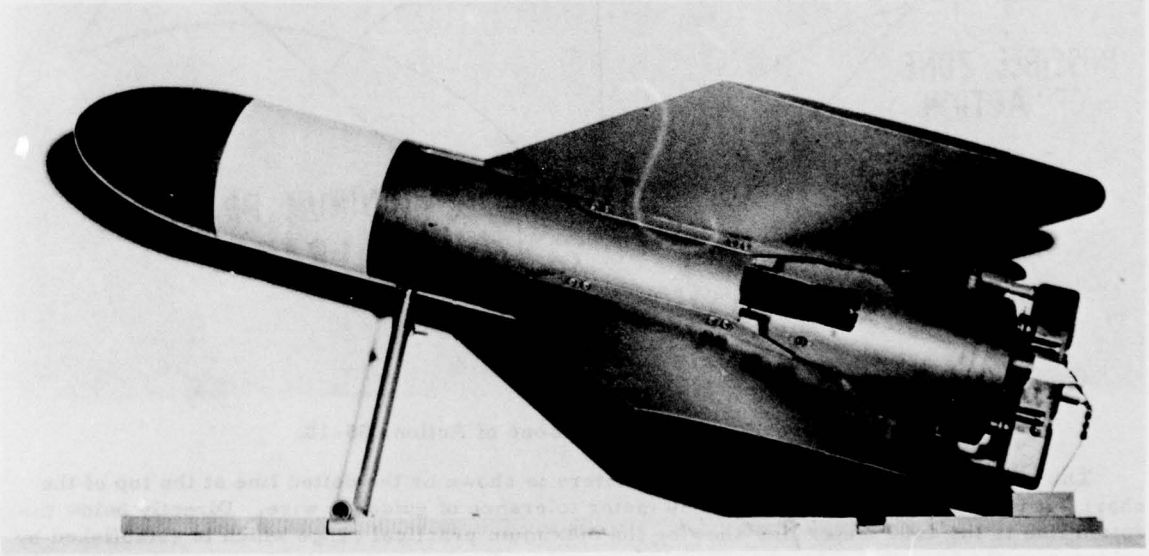


Figure 18. SS-11 on Adjustable Monopod.

the strike of the missile at the increased ranges. The missile at rest on its adjustable monopod has a total weight of 63 pounds, a length of 46 inches, has a wing span of 20.5 inches and a body diameter of 6.5 inches. Located on the rear of the missile are two pyrotechnic flares. The addition of the second flare further aids the gunner at the increased ranges. The propulsion system is the same type found in the SS-10, except that the speed of the missile gradually increases in flight. The missile is launched with an initial velocity of 100 meters per second, or approximately 225 miles per hour. During the first 17 seconds of flight, the speed of the missile gradually increases from 100 mps to 190 mps or approximately 425 miles per hour. The guidance equipment utilized by the SS-11 is identical to that of the SS-10 with a few modifications on some of the individual pieces of equipment.

The fins of the SS-11 are also set at an angle to the body of the missile causing it to rotate in flight. Guidance of the SS-11 is effected by four spoilers mounted on the rear of the missile. These spoilers deflect the exhaust from the sustainer motor controlling the elevation and direction of the missile during flight.

Thus far in the presentation, we have discussed both the SS-10 and SS-11 missiles. The United States Army Infantry School has at the present time the mission of training gunners for the User Service Test of the SS-11 system. In January 1960, the United States Army Infantry School will have the mission of training SS-10 personnel for the assault weapons platoon. Based on the experience gained during the troop test of the SS-10 conducted at Fort Benning during the second and third quarters of fiscal year 1959, the Weapons Department portion of this mission will be accomplished by conducting this program of instruction (Figure 19).

PROGRAM OF INSTRUCTION

92 HOURS

	HOURS
1. DESCRIPTION. NOMENCLATURE AND FUNCTIONING	5
2. CREW DRILL	20
3. TECHNIQUE OF FIRE	3
4. GUNNER TNG SIMULATOR S-55	12
5. GUNNER TNG CINETIR DX-40	8
6. RANGE FIRING	36
7. GENERAL SUBJECTS	8
	92

Figure 19. Program of Instruction.

Five hours is allotted for description, nomenclature and functioning of the missile and its guidance equipment to include maintenance and platoon organization. This is followed by 20 hours of crew drill comprised of 5 four-hour blocks covering vehicular mount, vehicular mount gunner offset, ground mount, and vehicular mount with additional missiles set out (a combination of both vehicular and ground mount crew drill). The final four hours consist of a county fair exercise designed to test the degree of proficiency attained by the platoon in their crew drill training. The next three hours are devoted to technique of fire which includes methods of employment, range determination and preparation of range cards.

Because the accuracy of the SS-10 system is primarily dependent upon the gunner's ability to control and align the missile on the target, the hours devoted to gunner training are the most important in the program of instruction. A total of twenty hours is spent on gunner training; twelve on the simulator and eight on the cinetir. The simulator, which is found in the combat support company of each Infantry battle group, consists of an electronic cabinet and a control stick, a signal generator and a tripod which are the same as in the guidance equipment. The simulator incorporates a cathode-ray oscilloscope, similar to a television screen, on which is projected a blue luminous spot which represents the flare of the missile. The spot is controlled by the gunner by means of the remote control stick. Simulator training is divided into 48 fifteen-minute periods. These periods are arranged progressively, starting with simple control exercises and progressing to more difficult and timed exercises. Each student gunner must successfully complete each period before progressing to the next.

The cinetir, which is found only at major training centers, is an electronic movie simulator and is larger and more complex than the simulator. In place of the cathode-ray oscilloscope, the cinetir employs a 16mm movie projector equipped with a cinemascopic lens and screen. A white spot, which represents the missile flare, is projected on the screen by a spot projector. This spot is controlled by the gunner by means of the control stick. By use of the movie projector, the gunner is trained under realistic conditions, with moving tanks maneuvering tactically. Through the use of these two training devices, the number of missiles required to adequately train gunners is greatly reduced, thereby decreasing the overall cost of the program of instruction.

The final phase of marksmanship training is the range firing of 13 missiles by each gunner. Thirty-six hours are allotted for range firing, which consists of 6 exercises, in which the gunner fires under varied conditions and at various ranges. During marksmanship training, the average gunner should achieve 60% hits, and with additional missiles, the hit probability should be increased to 80%.

Eight hours are allotted for general subjects which include examinations and critiques.

The SS-10 antitank guided missile is found in the assault weapon platoon of the combat support company in the Infantry division battle group. This platoon consists of one officer and twenty-eight enlisted men organized into a platoon headquarters and five squads. Each squad is composed of a squad leader, gunner, assistant gunner, and two ammunition handlers.

The squad's transportation consists of a 1/4-ton truck modified with the SS-10 mounting kit and a 3/4-ton truck with trailer for carrying ammunition. The basic load consists of 3 missiles on the launching vehicle, 6 missiles on the 3/4, 8 on the trailer and 8 at battle group trains for a total basic load of 25 missiles. The equipment organic to the squad gives it the flexibility to launch the SS-10 from the ground, vehicle or combination of both.

The principal method of launching at this time is from the 1/4-ton truck. It carries three missiles mounted and ready for launching. The missiles may be elevated from 0^{o} to 35^{o} by raising or lowering the launching platform of the vehicle. The angle of launch of the missiles is

measured from 0° to 12° by setting the spirit level mounted on the left side of the zero length launcher. For angles greater than 12°, the missile must be visually aligned so it will clear the obstacle over which we are firing. Up to ranges of 800 meters, the gunner guides the missile with his naked eye. For ranges exceeding 800 meters, the gunner is required to use binoculars.

We normally employ the missile from a defilade position which will give us protection from flat trajectory fire and prevent detection of the missile's backblast. It is possible for us to select such a launching site due to the fact that we can change the elevation of the launching platform and the angle of launch of the missiles. However, when firing from a defilade position, we cannot leave the gunner on the vehicle. For this purpose we carry a 100-meter cable mounted on the side of the 1/4-ton vehicle. This cable allows us to move our gunner 100 meters to the front, flanks or rear.

Upon receipt of this command the gunner removes the tripod with control box and binoculars, secures a telephone and one end of the hundred-meter control cable and moves his position to where he can observe his front and still guide the missile to the target. Upon arrival at his position the gunner sets up his equipment, makes his cable connections and establishes contact with the assistant gunner. Meanwhile, back at the vehicle, the assistant gunner connects the other end of the 100-meter control cable to the signal generator and plugs in his telephone.

To provide us with increased firepower, additional missiles may be ground mounted and launched in conjunction with the vehicular mounts. This is accomplished by first removing the secondary selector box from the vehicle and placing it on the ground. The ammunition handlers then move forward with the cables from the ground conversion kit and place them in position by the selector box. The ammunition handlers will then return to the 3/4-ton vehicle to secure missiles.

The assistant gunner unrolls the cables and makes his connections. The squad leader's duties are to supervise and assist where necessary. Upon completion of these connections the circuit test is conducted.

The circuit tester simulates a missile and performs two functions. First, it tests all the components of the system for malfunctions by causing the four small lights at the top of the circuit tester to light up in the proper sequence if the system is functioning properly. Secondly, the needle on the micro-ammeter indicates whether commands generated at the control stick have continuity through the guidance system to the missile.

There are two things we wish to point out at this time. First, keep in mind that all actions are performed simultaneously and second, that the gunner would be farther away from the launching site than he is now.

Each missile comes packed in its own individual container. In preparing the missiles for firing, the batteries are first removed from the battery well in the top of the container. Using the battery tester, the senior ammunition handler tests the batteries to insure they contain the proper amount of voltage. The two batteries are always tested prior to assembling the missile for firing since weak batteries will make the missile difficult to control in flight. If the batteries are too weak, they will cause the missile to malfunction.

When preparing a missile for firing from its container, the front and rear panel of the container are removed, the batteries inserted and the warhead assembled to the body by means of the toggle fasteners. The launching elevation is adjusted by the monopod in the container. The missile is anchored for firing by driving into the ground the anchoring rods and spades on the rear of the container.

In addition to firing from within the container, we can remove the missile and fire it from the ground. The procedure for preparing the missile for firing is the same except we elevate the missile by use of the U-frame and anchor it with the small anchoring rods on the launching mount. The final step is connection of the missile cables which is done on order of the squad leader.

Using these methods of employment, we have the capability of launching 3 missiles from the vehicle and 6 from the ground.

In areas which are inaccessible to the launching vehicle, the SS-10 can be completely ground mounted. The 100—meter cable which is now on the vehicle can be removed and mounted on a stand that is part of the ground conversion kit. The signal generator is removed from the vehicle and a portable battery is substituted for the vehicle battery.

Section V. 4.2-INCH MORTAR PLATOON

CAPTAIN EVERETT R. MURRAY

Instructor, Mortar Committee, Weapons Department

In 1956, as a part of ROCID, the responsibility for the 4.2-inch mortar was transferred to the Artillery and a mortar battery, consisting of two firing platoons each equipped with four 4.2 mortars, was organized. In January of this year the responsibility for the 4.2 mortar was transferred back to the Infantry and a new organization, the heavy mortar platoon, was established to employ this weapon. This new platoon is a compact fighting organization, directly under the control of and capable of responding instantaneously to the desires of the battle group commander. Although reduced in strength and total weapons when compared with its predecessor, the mortar battery, the heavy mortar platoon still retains the capability of massing a heavy volume of accurate indirect fires for the rifle elements of the Infantry battle group.

The platoon is organic to the combat support company of the Infantry division battle group and consists of 8 officers and 84 enlisted men. The reduction in strength as compared with the mortar battery, which had 11 officers and 135 enlisted men, was made possible by first, freeing the organization of the administration and logistical workload of a normal company size unit, and second, reducing the number of weapons from 8 to 6.

In order that you may better understand the employment and capabilities of the platoon, let us discuss briefly its organization (Figure 20). First, there is a platoon headquarters which consists of 2 officers and 5 enlisted men. A distinctive feature of this organization is the fact that the platoon is commanded by a captain. This marks a first for the Infantry. The platoon commander will operate directly under the control of the battle group commander. The liaison officer is the second-in-command and has the primary duty of maintaining liaison with battle group headquarters. His duties will keep him fully abreast of the tactical situation, facilitating his assumption of command in the event of the absence or loss of the platoon commander.

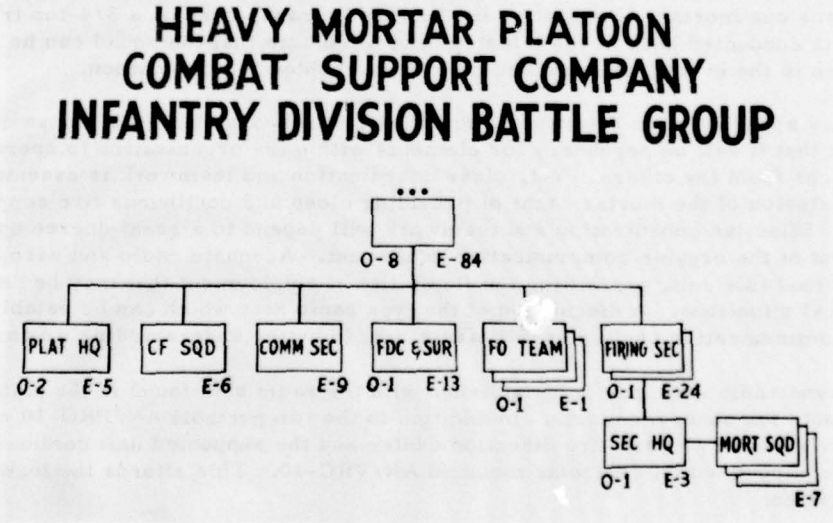


Figure 20. 4.2-Inch Mortar Platoon Organization.

A counterfire squad, formerly located in the headquarters company of the battle group, is now an organic part of the platoon. This change from the previous organization permits closer relationship between the counterfire detection means and the primary counterfire weapon of the battle group, the 4.2-inch mortar. The squad consists of 6 men and is equipped with the latest sound-ranging devices for the detection of enemy mortar and artillery weapons.

The communication section consists of 9 enlisted men. The communications chief supervises the section in establishing and maintaining the radio and wire communications upon which the effective employment of the 4.2 mortar is greatly dependent.

The fire direction center and survey section contains one officer and 13 enlisted men. Controlled by the fire direction officer, the fire direction center has the primary responsibility of computing data for targets and controlling the fires of the firing sections. One of the most outstanding features of the fire direction center is that it has the personnel and equipment to operate, when necessary, two independent fire direction centers.

The fire direction officer also controls the survey party. As prescribed by the fire direction officer, the chief of survey party supervises the survey team in conducting the platoon survey requirements. Priority will be given to determining the coordinates of each firing section and then, if time permits, the survey will be expanded to locating selected observation posts and targets. Current Artillery doctrine states that the direct support artillery battalion supporting the battle group will, when possible, survey to a point within 1000 meters of the platoon's position area. The mortar platoon survey will normally commence at this point. This will permit common control for both 4.2 mortars and artillery weapons, facilitating fire direction and the exchange of survey information.

There are 3 forward observer teams in the platoon. Each team consists of one officer and one noncommissioned officer. The primary responsibility of the team is to accompany the front line units in combat and adjust fire for the mortar platoon and, when necessary, for other indirect fire weapons.

The firing section, of which there are two in the platoon, is equipped with three 4.2 mortars. Each section consists of one officer and 24 enlisted men. The section commander is responsible for the conduct of fire for the three mortar squads in his section. Each squad has 7 men and mans one mortar. Presently, the mortar is transported on a 3/4-ton truck with trailer. Tests conducted here at the Infantry School indicate that the squad can be readily reduced to 5 men in the event that a tracked carrier is adopted for the platoon.

It becomes apparent when discussing the duties and responsibilities of the various sections in the platoon that it will be necessary for elements within the organization to operate at extended distances from the others. Yet, close coordination and teamwork is essential in performing the mission of the mortar: that of providing close and continuous fire support to the battle group. Effective coordination and teamwork will depend to a great degree upon the proper employment of the organic communication equipment. Adequate radio and wire equipment has been provided this unit, permitting the flexibility of employment that may be demanded by various tactical situations. A discussion of the type radio nets which can be established with the organic communication equipment will assist you in better understanding its capabilities.

Several type radio nets may be established with the radio sets found in the platoon (Figure 21). First, note the observer teams. In addition to the two portable AN/PRC-10 radios to be used in communicating with the fire direction center and the supported unit commander, the team is also equipped with a vehicular mounted AN/VRC-10. This affords the team a greater range of operation.

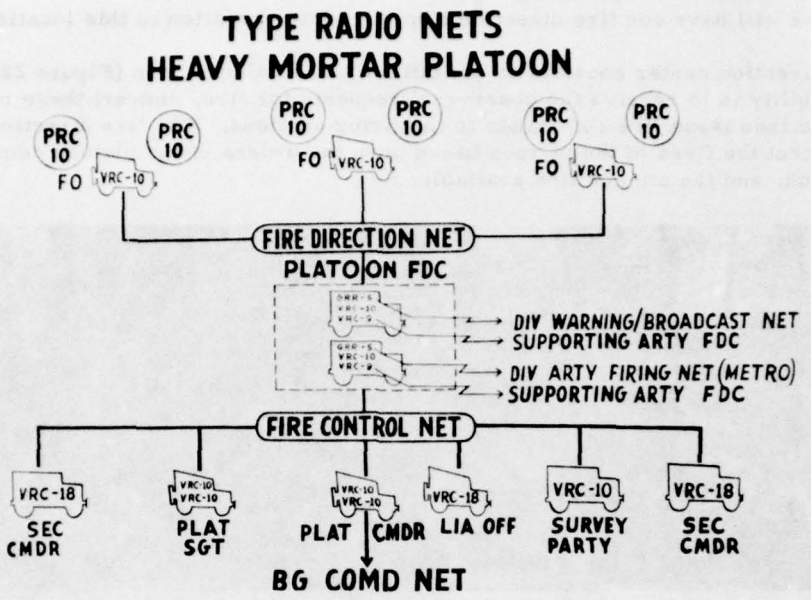


Figure 21. Type Radio Nets in 4.2-Inch Mortar Platoon.

Next, let us look at the radio sets found in the fire direction center. Observe that the fire direction center has the capability of monitoring the division warning broadcast net, the supporting artillery FDC net, and the division artillery firing net. These capabilities permit the close coordination of fires, the exchange of information, and the timely receipt of metro data. Also note the duplication of radio sets mounted in the two 3/4-ton trucks. If demanded by the situation, the fire direction center can split into two separate centers and operate efficiently for extended periods.

The platoon commander is also provided with two radio sets. This enables him to control the unit while maintaining continuous communication with the battle group commander.

On the battlefield of tomorrow greater reliance will be placed on radio communication. However, time permitting, wire communications will be established. The type wire nets to be established by the mortar platoon will closely parallel the radio nets.

The recommended method of employment of the 4.2-inch mortar platoon is in general support with its fires being controlled by a centralized fire direction center. When employed in this manner, the basic firing unit of the platoon will normally be the section.

Imagine a platoon of 4.2-inch mortars emplaced in surveyed firing positions to your right and left rear. The firing sections, designated as RED and BLUE for identification purposes, are located as follows: RED section is in a position approximately 300 meters to your right rear. BLUE section is approximately 400 meters to your left. Both sections have been pre-

fired on a registration point to your front. Although the sections are split, as would be the normal method of emplacement, they are under the control of a centralized fire direction center; and the ability to mass the fires of the platoon is retained. Normally, the fire direction center would be located in the proximity of one of the firing sections; however, for the sake of the problem, we will have our fire direction center go into operation in this location.

The fire direction center consists of one officer and 5 enlisted men (Figure 22). Its primary responsibility is to receive the observers' requests for fire, convert these requests into firing data, and then issue fire commands to the firing sections. The fire direction officer will personally control the fires of the platoon based upon the orders of the platoon commander, the tactical situation, and the ammunition available.

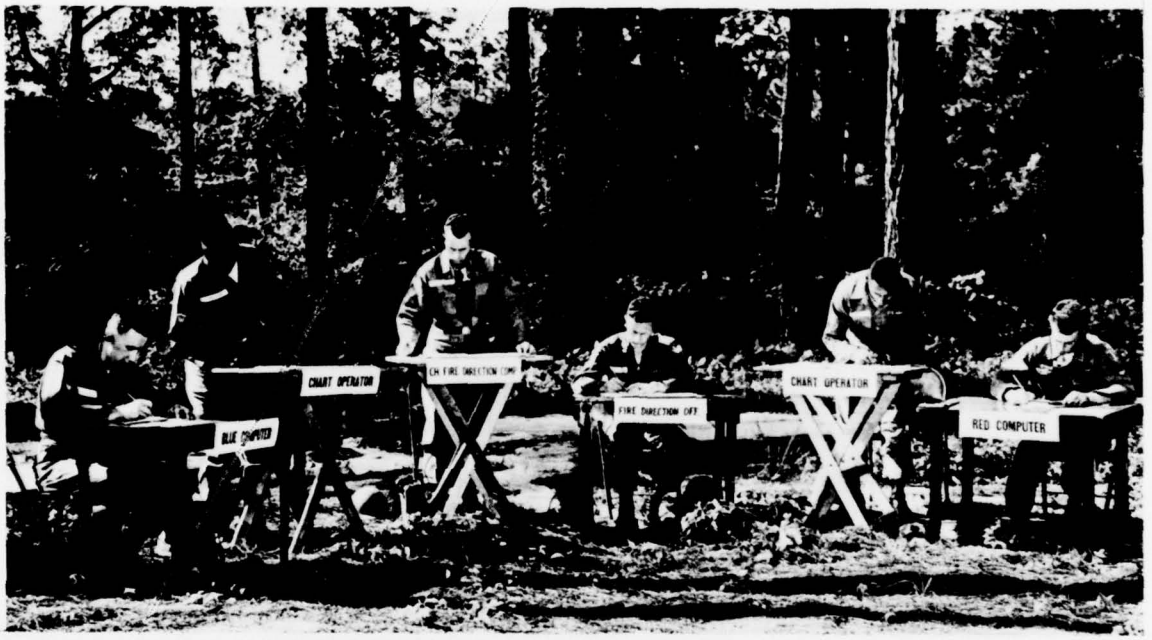


Figure 22. 4.2-Inch Mortar Platoon Fire Direction Center.

Our forward observer transmits an initial fire request to the fire direction center to engage a target he has detected to his front. When the fire direction officer receives a request for fire, he must determine the priority of fire and the manner in which the target will be engaged, based upon the information furnished by the observer. Also, the observer has requested section fire. This indicates to the fire direction center that the observer desires the section to fire a one round volley and the observer will, if necessary, determine a correction and request a fire for effect.

The observer sent in a correction combined with a request for a fire for effect. RED chart operator determined the deflection and range at which to fire the section and inform RED computer of this information. RED computer formulated the fire command to be sent to the section based upon the data provided by the chart operator and the fire direction officer. While RED section is engaging this target, BLUE section follows the mission. Thus, in the event that additional fire is required, BLUE section can join in the mission. Also, in a situation where another observer is requesting fire, BLUE section can be utilized independently while RED section continues its mission. In this case the fire direction officer had directed RED section to fire, section 5 rounds, a total of 15 rounds.

Upon observing the fire for effect our observer was satisfied with the results of the fire. Therefore, he ended the mission and rendered a casualty report. If he were dissatisfied with the results, he would determine any corrections and request a repeat fire for effect.

The platoon as now organized has the capability of delivering timely and accurate indirect fire essential to the Infantryman in combat. However, the best results can only be obtained when the personnel within the platoon are trained and used properly.

Section VI. NEW MORTAR DEVELOPMENTS

FIRST LIEUTENANT MYRON E. LYMAN

Instructor, Mortar Committee, Weapons Department

The effectiveness of mortar fire will depend to a great degree upon the accuracy that can be obtained from the fire control instruments and equipment used by the heavy mortar platoon. During this phase of our conference we will discuss the most recent developments in these fire control instruments and equipment.

FIRE CONTROL INSTRUMENTS

First, let us discuss the fire control instruments used in the fire direction center of the mortar platoon. Prior to the transfer of the 4.2-inch mortar to the Artillery, the primary instrument used by the fire direction center was the range deflection protractor (Figure 23). Basically, the protractor consists of a numbered range arm, a deflection arc, and a vertex. It is constructed of aluminum and contains a scale of 1:25,000 yards. This protractor is used in conjunction with a grid sheet or map firing chart to determine range and deflection. The deflection determined is sent to the mortars as part of a fire command. The range that is de-

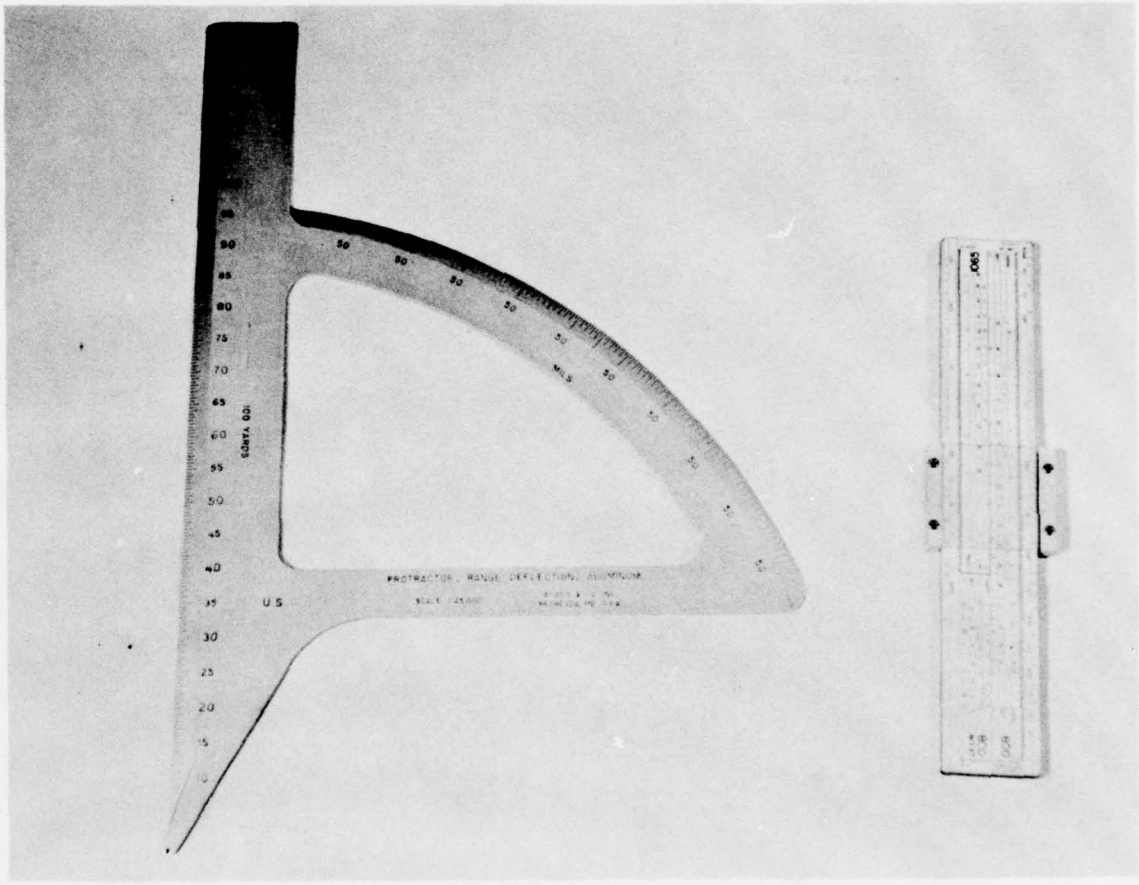


Figure 23. Range Deflection Protractor and Graphical Firing Table.

termined from the range deflection protractor must be converted to charge and elevation by use of a graphical firing table (Figure 23). The graphical firing table is a special type of slide rule which has printed on its surface ballistic data. It is equipped with a sliding indicator which may be moved across the ballistic surface, converting any given range in yards to charge, elevation, time of flight, drift, and other ballistic information. This information is also sent to the mortars as part of a fire command.

During the period that the 4.2-inch mortar was under Artillery control, a graphical firing table fan for use with the 105mm and 155mm howitzer was developed. This fan was further modified for use with the 4.2-inch mortar. The fan incorporates the function of both the range deflection protractor and the graphical firing table (Figure 24). The fan is constructed of pla

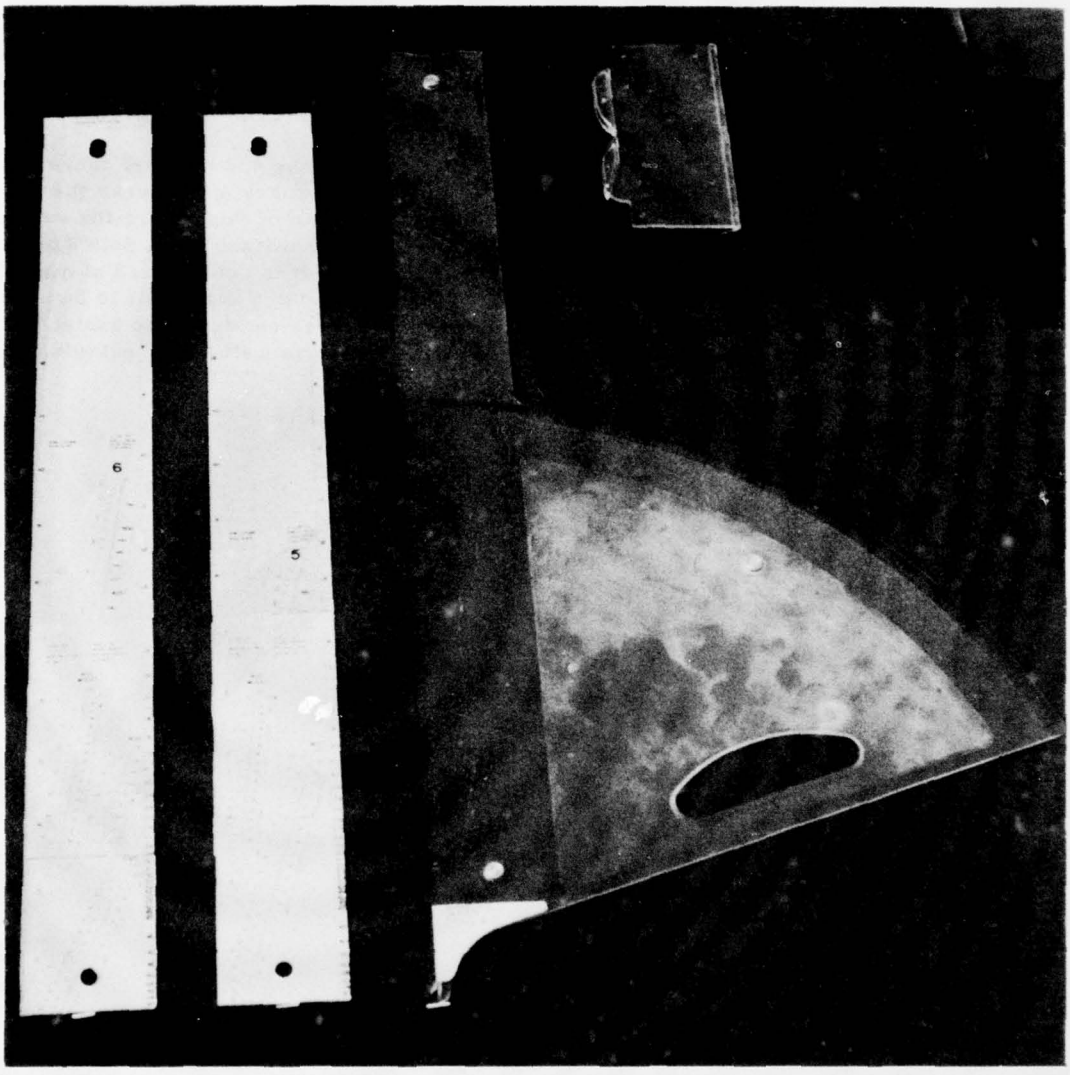


Figure 24. Graphic Firing Table Fan for 105mm and 155mm Howitzers.

and has a scale of 1:25,000 meters. Its configuration is similar to the range deflection protractor. However, on the range arm, two protruding rivets are found. These rivets serve the purpose of holding ballistic plates to the base. The plates contain ballistic information similar to that found on the graphical firing table. A sliding indicator, called a cursor, is used with the instrument to assist in reading the ballistic data. Three of the ballistic plates are available with each fan for the 105mm howitzer. At the present time, however, plates do not exist for the 4.2-inch mortar. Nevertheless ballistic data for the 4.2-inch mortar has been produced in paper form and these data can be cemented to the 105mm howitzer plates as shown. The Artillery has used this fan with the 4.2-inch mortar paper ballistic plates as the principal fire control instrument with the 4.2-inch mortar. The advantage of this instrument is that it eliminates the necessity for converting range to charge and elevation inasmuch as this data can be obtained directly from the fan itself. In addition to saving valuable time in computing firing data, the instrument makes use of the metric system.

When the 4.2-inch mortar was returned to the Infantry this year, the primary TOE fire control instrument was still the older range deflection protractor. However, one 105mm howitzer graphical firing table fan was allocated to the headquarters of the mortar platoon.

Although the 105mm howitzer fan can be modified for use with the 4.2 mortar, there exists a need for a GFT fan designed primarily for mortar usage. In February of this year the United States Army Infantry Board received three prototype models of a fan of this nature for service tests (Figure 25). Its design is generally the same as the 105mm howitzer fan. Both 81mm and 4.2-inch mortar ballistic plates are provided as components. It is constructed of metal instead of plastic and has the shape of a 1600-mil arc. This enlarged arc enables it to be used as a protractor. A "built-in" coordinate square also makes it a convenient device to assist in determining map data. The deflection arc is numbered on the inside as well as the outside. This

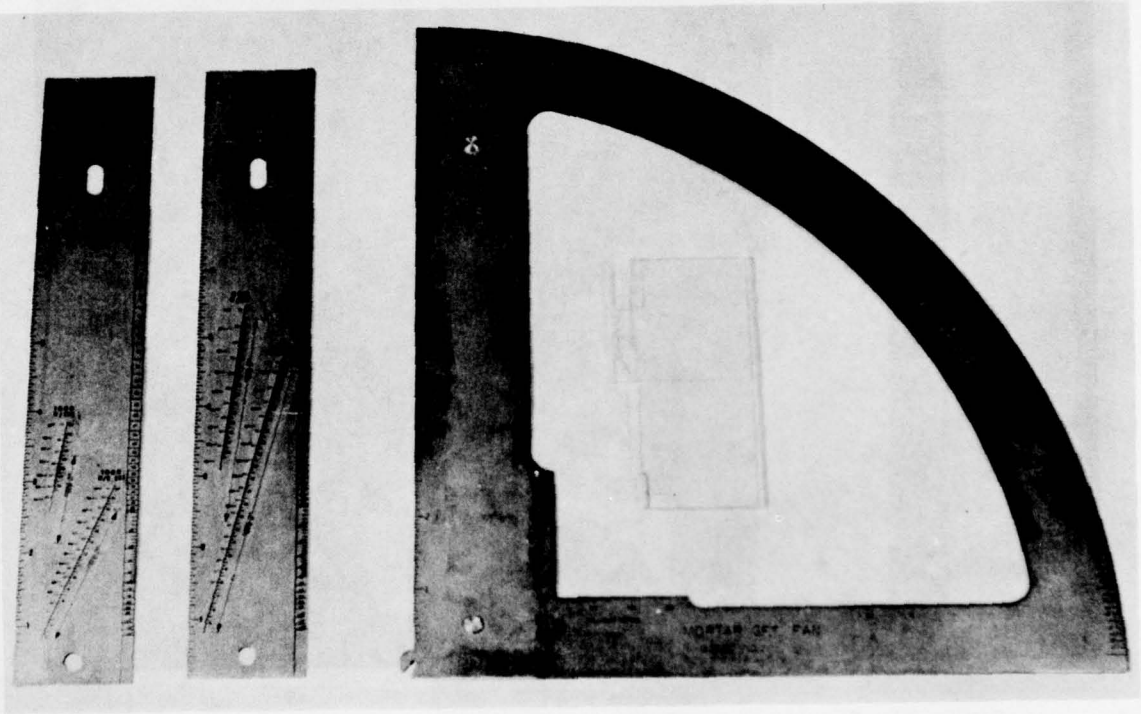


Figure 25. Proposed Graphic Firing Table Fan for 4.2-Inch Mortar.

aids in eliminating confusion in placing out deflection indices of more than one firing unit. The vertex of the fan will be used with a special pin which will not bend with use, thus resulting in more accurate data.

The Infantry School evaluated this fan and concluded that a few modifications would make it an even better instrument for 4.2-inch and 81mm mortar usage. The recommended modifications consist of the following: first, the basic scale of the fan should be changed to 1:12,500 meters. This is a more desirable scale for use with mortar gunnery than 1:25,000. Second, the range arm should be extended. The change in scale would make this necessary so that the range arm would be capable of measuring the maximum range of both weapons. Third, the ballistic plates should be modified so as to better use their space and to include an illuminating firing table. Last, the edges of the deflection arc and coordinate square should be bevelled for ease in obtaining more accurate readings.

These modifications were approved by USCONARC and a new model is presently being constructed for service tests. We at the Infantry School feel that this instrument with modifications will fulfill the need for a common fire control instrument and will result in more accurate and rapid mortar fire. It is visualized that this instrument will be used as the primary fire control instrument for the 4.2-inch mortar and as an alternate for the 81mm mortar.

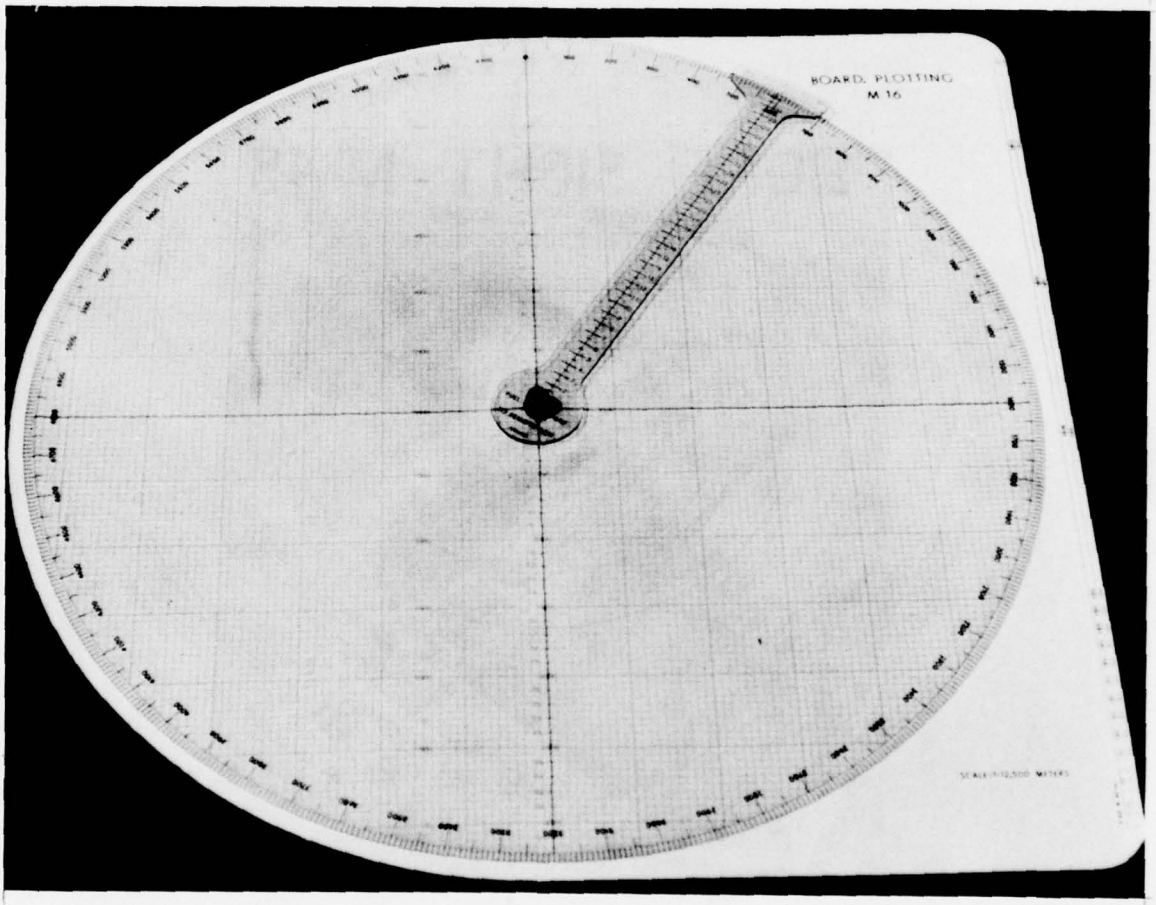


Figure 26. M16 Plotting Board.

The M16 plotting board (Figure 26) is another common fire control instrument developed for 81mm and 4.2-inch mortar usage. It has been recently standardized and will replace the M10 plotting board. It will be the primary fire control instrument for the 81mm mortar and alternate for the 4.2-inch mortar. As far as the 4.2-inch mortar is concerned, it will be used in special and fast moving situations where it may prove difficult to operate effectively with the graphical firing table fan. Being larger than the M10 plotting board, the M16 has the desired scale of 1:12,500 meters which enables the computer to plot more accurately. The increased size of the instrument permits us to locate the 81mm mortars at the pivot point and compute firing data to within 300 meters of the maximum range of the mortar. This was not possible with the M10 plotting board. Another added feature is a removable range arm. This range arm eliminates the need for continually rotating the disk back to the index to read deflection and range, thereby saving valuable time.

Under development for the M16 are graphical firing table range arms for both the 81mm and 4.2-inch mortars which will permit the operator to read elevation and charge directly from the board. This can be accomplished by printing special designed firing tables directly on the removable range arms. This will eliminate the need for referring constantly to firing tables to determine charge and elevation as is presently done. In addition to speeding up the computation

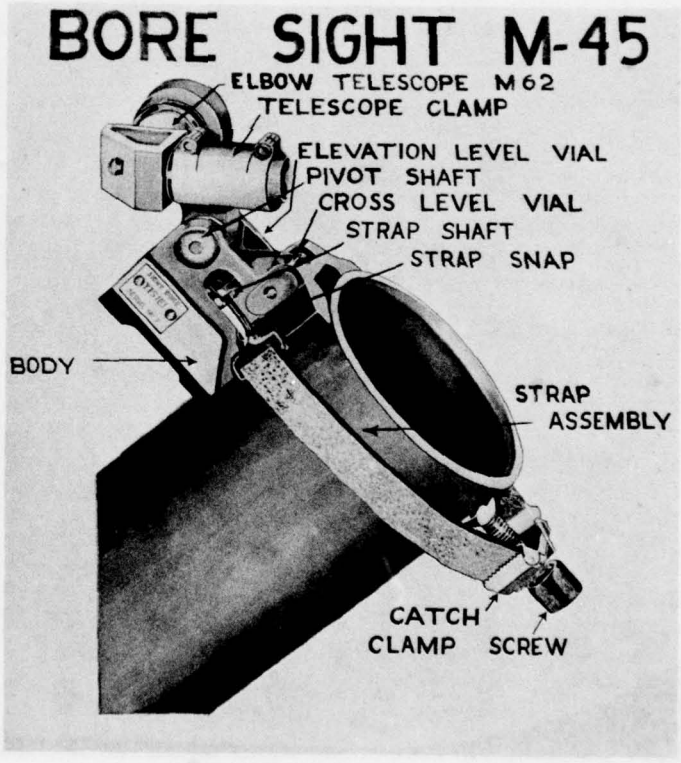


Figure 27. Bore Sight, M45.

of firing data, it will eliminate the necessity for paper type firing tables, which are undesirable since they will not withstand the elements of "foxhole" type operations.

TRAINING LITERATURE

The new 4.2-inch mortar organization and the changes in fire control instruments have resulted in an immediate requirement for training literature outlining the up-to-date procedures for operating mortar units. To meet this demand the Infantry School is presently revising FM 23-92, the 4.2 mortar manual. Plans are to use the draft of this manual as an interim training publication until such time as the final manual is published. This manual will contain the detailed information on the fire control instruments discussed thus far and the latest techniques in mortar gunnery.

In December of 1958, the new 81mm mortar field manual, FM 23-90, was published. This manual contains the latest techniques and procedures of 81mm mortar operations, to include an appendix covering the 81mm mortar mounted on a tracked carrier.

BORE SIGHTING DEVICE

The fire control instruments discussed above will provide the desired degree of accuracy in computing data, provided they are used properly. The accurateness of the rounds fired from the mortar however, will also depend on calibration of the sight unit used in laying the mortar for elevation and direction. The sight unit M34, which is used on both the 81mm and 4.2 mortars, is easily knocked out of calibration therefore making necessary the need for frequent bore-sighting. Formerly this was accomplished with an aiming circle. Without dwelling on its deficiencies, suffice to say that it was time consuming and did not provide the desired results. The need for a better instrument was realized and effort was directed toward its development. This has resulted in the recent adoption of a bore sighting device, the bore sight M45 (Figure 27).

The device contains a solid base, crosslevel and elevation vials, an M62 telescope, and an attachment strap. Its simplicity of design, durability, and portability makes it particularly suitable for mortar usage. It has been recommended to USCONARC that this instrument be made TOE to each firing section of the 4.2-inch mortar platoon and the weapons platoon of the rifle company. With this device being used properly, we can expect greatly improved accuracy of our mortar fires.

FIELD-EXPEDIENT AIMING POST

Another development for our mortars which deserves mention at this time is the field-expedient aiming post. Those of you familiar with mortar employment realize that one of the problems faced by mortar unit commanders was the retention and maintenance of usable aiming posts. It was inevitable that when a unit went into the field the aiming posts authorized for use with the mortar were either lost or rendered unserviceable. A mortar instructor here at the school, Captain Robert L. Copeland, developed an expedient post to assist in eliminating this difficulty (Figure 28).

The post is constructed from 4.2 mortar cartridge extensions, screwed together to the desired length. A steel spike is attached to one end to facilitate its being driven into the ground. The extensions, discarded from cartridges to be fired at limited ranges, are normally available in the field. There is no doubt that this device will be used extensively by mortar units.

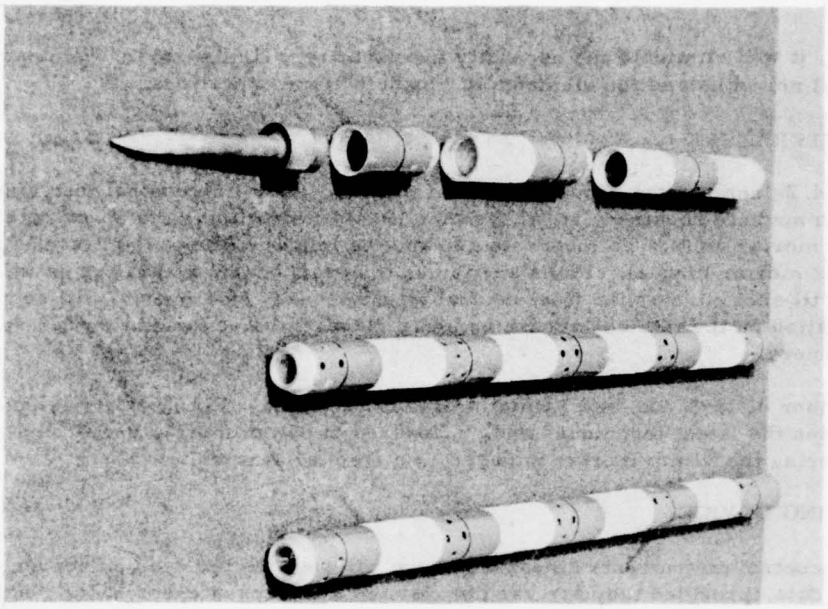


Figure 28. Field-Expedient Mortar Aiming Post.

MORTAR SUBCALIBER DEVICE

Recently developed is a subcaliber device for training 81mm and 4.2-inch mortar crews, called a pneumatic trainer (Figure 29). In developing this device the Army realized that frequently many units, especially of the United States Army Reserve and National Guard, will not have the necessary range facilities nor the live ammunition to properly train the indirect fire team of the Infantry mortars. To reduce this problem we have been using a training shell fired on a miniature range. Although the training shell proved to be an excellent training device, it was necessary to follow the shell throughout its flight in order to observe its impact. This proved quite difficult at times and distracted from realism. In addition, the accuracy of the shell left much to be desired. The development of the pneumatic trainer greatly reduced these undesirable limitations.

The trainer is a smooth bore, subcaliber device that is housed in its own carrying case. Adapters are furnished which allow it to be fired from the 60mm, 81mm, or 4.2-inch mortars. A bottle of compressed air is used to fire the device on a 12 1/2-meter, 25-meter or 50-meter range. Twenty small projectiles furnished with the set can be loaded with a spotter charge that gives a visible and audible signal upon impact. The projectiles land with a high degree of accuracy and can be retrieved and continuously refired by replacing the spotter charge. This instrument should prove to be a very valuable training aid for mortar units.

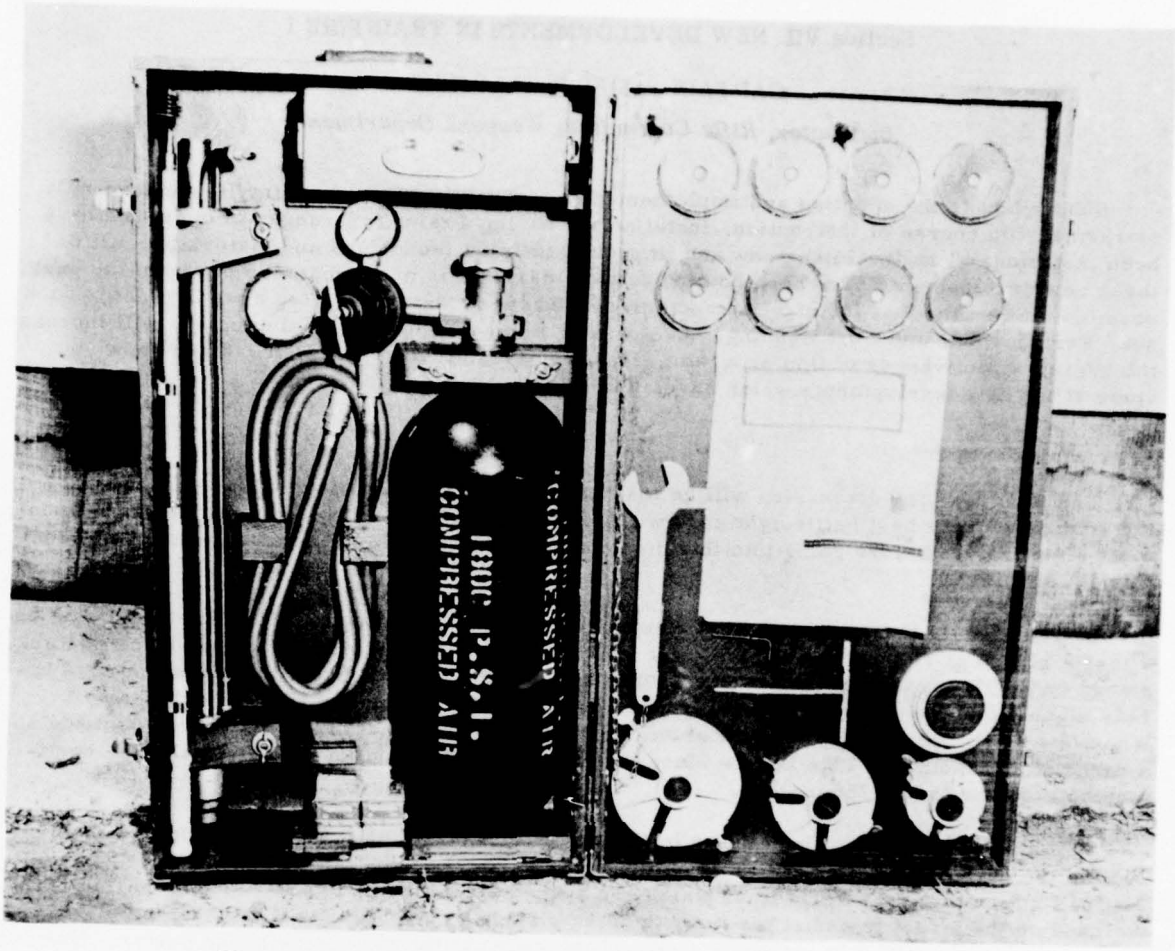


Figure 29. Pneumatic Subcaliber Mortar Training Device.

Section VII. NEW DEVELOPMENTS IN TRAINFIRE I

CAPTAIN JAMES R. SEMMENS

Instructor, Rifle Committee, Weapons Department

Subsequent to the adoption and implementation of Trainfire I as the Army's standard rifle marksmanship course of instruction, installations having Trainfire I ranges in operation have been instrumental in developing new and improved training techniques and materials. All of these new developments have been pointed toward making this marksmanship program the best possible. Since the last Infantry Instructors' Conference, personnel from Fort Ord, Fort Jackson, Fort Carson, and Fort Benning, have passed on ideas which, if implemented, will increase the overall effectiveness of this program. In this presentation we will discuss and show you some of the new developments which have evolved since the last conference.

ZEROING TARGETS

The first area for discussion will be the battlesight zeroing. It is readily apparent that the soldier with the best battlesight zero will be the soldier that will be able to fire his weapon most effectively. Before going into this discussion, let us briefly review the principles of battlesight zeroing.

In Trainfire I, the soldier obtains a battlesight zero for a range of 250 meters by firing on a target placed at 75 meters. This target consists of an 8.5-centimeter square, black paster placed on an "E"-type silhouette. The soldier aims at the bottom of this paster and adjusts his rear sights until the center of a three-round shot group falls at the top center of the paster. When this condition exists, the point of aim and the point of impact of the bullet will coincide at a range of 250 meters. This is true since the trajectory of the bullet drops exactly 8.5 centimeters between 75 and 250 meters.

With this principle in mind, let us look at the actual target as it appears to the rifleman. This is the standard zeroing target as outlined in FM 23-71, the Trainfire I manual (Figure 30). You will notice that it has grid lines which are spaced 2 centimeters apart. The grid lines are included on the target to assist the firer in determining the number of clicks of either elevation or windage required to move the strike of the bullet to the top center of the paster. One click of either elevation or windage will move the strike of the bullet one grid line or approximately 2 centimeters at a range of 75 meters.

The difficulty encountered with this target is that it is hard for the firer to place the square paster on the front sight blade in exactly the same place for each round fired. The soldier will either edge the front sight blade up into the black or will leave a considerable amount of white between the front sight blade and the bottom of the paster. This will cause a vertical displacement of the single shots within the three-round shot group. Also, because the paster is narrower than the front sight blade at 75 meters, there is a great possibility for lateral displacement. For an untrained rifleman such as a trainee, this can cause his battlesight zero to be inaccurate.

To overcome some of these difficulties and to add realism to the zero, Fort Ord has developed this zeroing target (Figure 30). You will notice that it is wider than the 8.5-centimeter square and is in the shape of a silhouette target. This target appears to be the same width as the front sight blade at 75 meters. The fact that this target is the same width as the front sight blade at 75 meters eliminates the possibility of lateral displacement. The problem of vertical displacement still exists. The 8.5-centimeter square paster is still present and is outlined in white. This assists the firer and assistant instructor in evaluating the shot groups. Also, you will notice that a circle has been placed at the top of the outlined square. This circle is 5 centimeters in diameter, and the individual is considered to be properly zeroed if the center of

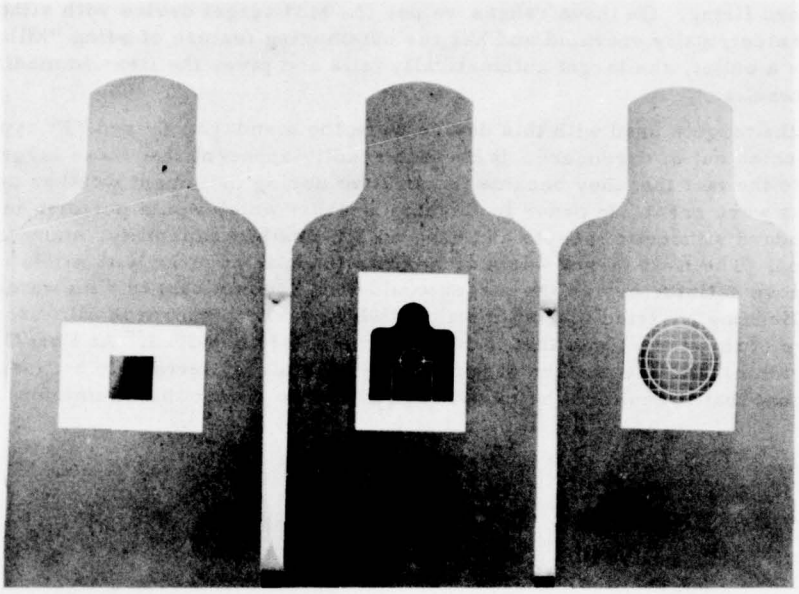


Figure 30. Zeroing Targets: Standard Target (Left), Ft. Ord Target (Middle), Ft. Benning Target (Right).

the three-round shot group falls within this circle. This target also has the 2 centimeter system to assist the firer and assistant instructor in making rapid corrections.

At Fort Benning, we have developed this target (Figure 30). It consists of a black circle or bull's-eye exactly 17 centimeters in diameter, double the normal 8.5 centimeters used in the other two targets. Inside this bull's-eye are two concentric circles; one 5 centimeters in diameter and the other 13.5 centimeters in diameter. The inner circle is for the same purpose as that found on the Fort Ord target -- to give the assistant instructor immediate knowledge of the results of the firer's shot group. The larger circle is used only as a guide to determine if a soldier is applying the principles of good shooting. If he is, his shot groups should fall within this circle. With this target, a more distinct aiming point is presented to the soldier. There is no problem in resting the bull's-eye on the front sight blade without edging into the black or having a white space between the front sight blade and the bottom of the target. Tests have shown that it is much easier to take a proper sight picture on the arc of a circle than any other shape. The fact that we are using a bull's-eye target does not conflict in the least with the premises of Trainfire I. We are still obtaining a point of aim which is a point of impact at 250 meters. Thus, with this target an assistant instructor can rapidly determine two important points: one, that the soldier is applying the principles of good shooting; and two, that the soldier has a proper battlesight zero. The outstanding feature of this target is that it affords the trainee the best possible target for battlesight zeroing with respect to the sight picture.

A limited test of these three targets has been conducted at Fort Benning; however, it is too soon for the Infantry School to make definite recommendations for a change to FM 23-71. As a result of this test, a letter has been forwarded to USCONARC recommending that further testing be conducted at an installation training under the Trainfire I concept.

SILHOUETTE TARGETS

Once the soldier has obtained his battlesight zero, he is then ready to progress to field firing and record firing. On these ranges we use the M31 target device with silhouette targets. This device is electrically operated and has the outstanding feature of being "killable"; that is, when struck by a bullet, the target automatically falls and gives the firer immediate knowledge of his firing results.

Initially, the targets used with this device were the standard "E" and "F" type silhouette targets constructed out of cardboard. It became readily apparent that these targets were not satisfactory due to the fact that they became inoperative during inclement weather and the maintenance problems were great. In order to develop a target which would perform in the same manner as the standard silhouette targets and have an all-weather capability, many targets were devised and tested. The first target was a standard silhouette covered with a thin coat of aluminum. This did not prove satisfactory as the target would still become soaked with water during a rain. Next, at Fort Benning we tried masonite targets which would perform in all weather conditions. The bad feature of this target was that it could not be easily repaired. At Fort Ord, a target constructed of aluminum was devised (Figure 31). This target seemed to be the one we were looking for except that it could not be easily repaired. To repair this aluminum target for continued firing, one must remove it from the target device and place it on a curved surface--pound out the holes, and replace it in the target device. After being repaired one or two times, this target is turned in for salvage. Further, ricochet rounds tear large holes in this target which will allow a bullet to pass through the target without recording a "kill."

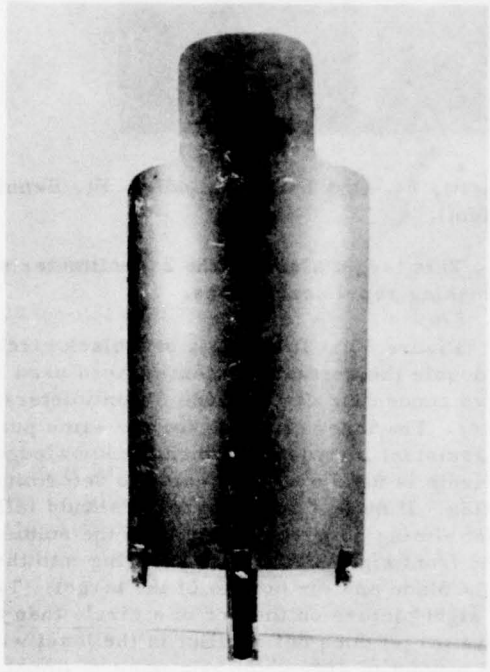


Figure 31. Aluminum Silhouette Target.

Figure 32. Fiberglass Target.

At Fort Jackson, a fiberglass target was used with great success (Figure 32). The target used was locally produced and tested. The target proved to be highly satisfactory for many reasons. One reason was its all-weather capability. Another was its ease of repair. A third reason was its ability to be constructed in various colors to correspond to natural vegetation. This is the target now being used at Fort Benning. As you can see, the maintenance problems are

very small with this target. Once the target is installed in the target device, it can remain in position until damaged beyond repair.

To repair the target, it must be in the UP position. The target repairman comes to the target with a fiberglass solution and paints over the holes made. Within 15 minutes, this target is ready to be used again.

The latest development is a three-dimensional target constructed of fiberglass (Figure 33). This target was devised by the U.S. Naval Training Device Center, Port Washington, N. Y. As you can see, the combat realism of such a target is great. Results of the testing of this target have not been consolidated as of this date; however, a target such as this may be exactly what we are looking for on Trainfire I ranges. We are progressing in the right direction with respect to targets and the problems involved in target maintenance. As an item of interest, the cost of the fiberglass targets locally produced is $2.00 for the "E"-type and $1.00 for the "F"-type. The 3-dimensional target has an initial cost of $4.00 per target; however, in production this cost would be greatly reduced. Even though the initial cost may seem high, over a period of one year this cost would be considerably less than the cost of standard cardboard targets because of fewer targets being damaged beyond repair and decreased maintenance costs.

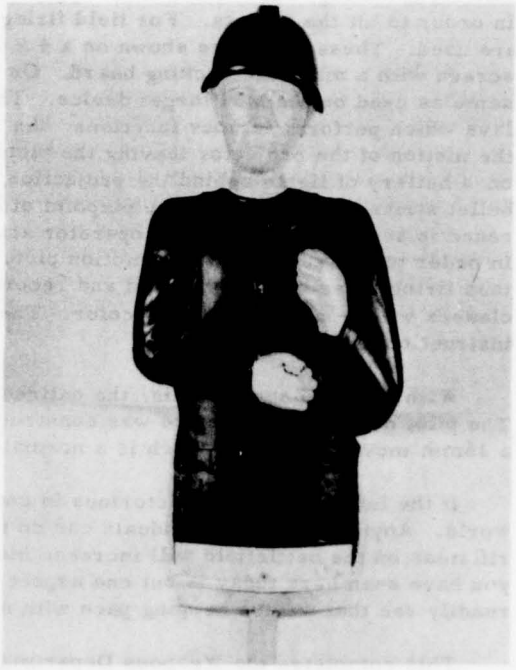


Figure 33. Fiberglass Three-Dimensional Target.

INDOOR TRAINFIRE RANGE

One of the big problems encountered in the implementation of Trainfire I is the training of Reserve and National Guard-type units where Trainfire I facilities are not available. Many ideas have come in from the field with respect to this problem. At Alfred University in New York, the PMS&T there has developed his own indoor Trainfire I course of instruction for use with the .22 cal rifle. Scaled down targets are used for the preparatory marksmanship phase of instruction. Breakable wafers are used as targets for the field firing portion of the instruction. To simulate record range conditions, landscape targets are prepared in duplicate. On the first target to be shown, all enemy positions are indicated. After a short observation period, this target is removed and the second will be shown -- this time only some of the targets are visible and the firer must remember the points of disappearance of the remaining targets. To simulate firing from the kneeling supported position, laboratory stools are used as supports. With a little initiative and a lot of imagination, any person can develop his own indoor Trainfire I range.

At Fort Benning, we are working on an indoor Trainfire I range also. All steps of Trainfire I training can be conducted on an indoor range starting with preparatory marksmanship and going through record firing. As an added attraction, combat firing can also be simulated. This is how it is done.

For preparatory marksmanship training, scaled down half-bull's-eye targets are used. All positions are taught with the exception of the standing foxhole position. A shot group test the

same as in period 7 of the standard course is presented. Once the individual has satisfactorily passed the shot group test, he is then ready to obtain a battlesight zero for his weapon. A scaled-down zeroing target is used and the same principles as in range firing are used. With this sight setting, the soldier must apply the principles of hold-off during the field firing phase in order to hit the targets. For field firing, record firing and target detection, training films are used. These films are shown on a 4 x 6 foot screen. This screen consists of a paper screen with a masonite backing board. On this backing board are three micro-switches the same as used on the M31 target device. These micro-switches are connected to a series of relays which perform various functions. As soon as the bullet hits this target, one relay stops the motion of the projector leaving the picture projected on the screen. A second relay turns on a battery of lights behind the projection screen. Thus, the soldier can see exactly where his bullet strikes the screen by the pinpoint of light which shines back toward him. As soon as his round is scored, the projector operator activates a switch which starts the picture moving again. In order to use such a device, motion pictures will have to be made which will project the various firing lanes of both the field and record firing ranges. For target detection, regular classes will be photographed in color. These pictures will have sound tracks when presenting instructional material.

With a device such as this, the entire Trainfire I program may be given on indoor ranges. The pilot model of this device was constructed for approximately $25.00, excluding the cost of a 16mm movie projector which is a normal item of issue.

If the Infantry is to be victorious in combat, our riflemen must be the best trained in the world. Anything we as individuals can do to improve or increase the efficiency of the combat rifleman on the battlefield will increase his chances for survival in any future warfare. What you have seen here today is but one aspect of the combat Infantryman's training, but you can readily see that we are keeping pace with new developments--all for the Infantryman.

This completes the Weapons Department portion of the 1959 Infantry Instructors' Conference Report.

CHAPTER 4
RANGER DEPARTMENT PRESENTATION

Section I. RANGER ORIENTATION

CAPTAIN LAWRENCE R. TRAPP

Chairman, Fort Benning Ranger Committee, Ranger Department

The purpose of the orientation is to acquaint you with certain aspects of the Ranger Course so that you may be better able to answer the questions of the students at your respective service schools and thereby encourage their application for attendance.

The history of the Army Ranger is a long and colorful one. Rangers have a proud heritage that dates back over 200 years to our French and Indian Wars and to Rogers' Rangers organized in the year 1756. Ranger techniques and methods of operation were habitually used by frontiersmen in the American colonies prior to the American Revolution, but it was Major Robert Rogers who was the first to organize a military unit to use such techniques and methods. After Rogers came Morgan, Marion, Mosby, Darby and Merrill, all contributing in part to this proud heritage. With the exception of the Spanish American War and World War I, we have had Ranger-type units operating in all of our conflicts. During World War II, the Ranger battalions operated in the Mediterranean theater, at Normandy and in the South Pacific. The concept during the Korean Conflict was to organize Ranger-Airborne companies. Volunteers were trained here at Fort Benning under what was then the Ranger Training Command. Six of these companies saw action in Korea.

In 1951 the Department of the Army directed that Ranger training be extended to all combat units, and further that Ranger training be placed on an individual basis. Note that this was a two-fold mission. One, that all Infantry units conduct Ranger training, and two, that the Commandant, United States Army Infantry School, train a Ranger cadre for the purpose of conducting a Ranger training program. In 1954 it was further decided that all Regular Army second lieutenants of the combat arms select and attend either Ranger or Airborne training.

The course covers a period of eight weeks, during which time 818 hours of instruction are presented. This averages out to more than 100 hours a week, most of which is devoted to night training. The course is divided into three phases. A preparatory phase of two weeks at Fort Benning physically hardens the student and reviews the basic skills of soldiering. From time of reporting to completion of the course the student is forced to adhere to rigid standards of discipline. All students are addressed as Ranger and are expected to be alert and responsive to orders. Following the preparatory phase, the class moves to the Ranger Jungle and Amphibious Camp, Eglin Air Force Base, Florida for three weeks of training in jungle, amphibious and air-landed operations. The student then goes to the Ranger Mountain Camp located just outside the old gold-mining town of Dahlonega in the mountains of North Georgia. For three weeks he trains in basic mountain tactics and techniques. During the Florida and Mountain phases of training the student is exposed to 16 basic problems, three of which are amphibious and three are air-landed. The patrol is employed as the teaching medium and varies in size from a 5-man reconnaissance patrol to a company-size raiding party. The patrols vary in time from several hours to 96 hours and in distance from several thousand meters to 70 kilometers. The student gets very little rest, averaging only five hours sleep per night.

Each patrol is accompanied and observed closely by a Ranger officer or noncommissioned officer. An aggressor enemy harasses the patrol, forcing the students into unexpected situations which call for prompt, sound decisions. Upon return each patrol is critiqued in detail by the Ranger observer. It is through this medium that the student has an opportunity for self-evaluation and analysis. It is through training such as this that a small-unit leader is developed who is

physically and mentally capable of sustained action in the atomic or space age, and one who will continue to exert his influence regardless of time, place or circumstances.

Training is realistic, tough and to a degree hazardous; the closest approach to combat conditions that can be achieved in a peacetime Army. The number and variety of situations faced by the Ranger student are equal to those that a soldier would gain in two or three campaigns in battle.

In summary, the Ranger Course is the highest form of Infantry training in the Army today. It develops the overall combat potential of the Army's junior leaders to a higher degree than any other course in the Army, and is of benefit to any man, regardless of branch or service. An individual in Ranger training gains an insight into himself and his fellow man. He develops self-discipline. Men who make excellent tactical decisions in the classroom and in normal training programs sometimes fail miserably under the stress of uncomfortable field conditions. Hunger, fatigue and the press of a tactical situation uncover weaknesses an individual never knew he had. Men under such conditions often lose their poise, their self-confidence, their sense of direction, their equipment and, worst of all, control of the men they are leading. The Ranger course combat conditions the student to the hazards of weather, terrain and the enemy. As one student recently expressed it, "Ranger training is the best insurance I've ever taken."

HAND-TO-HAND COMBAT

The average soldier, if trained only in the use of his basic weapon, loses his effectiveness if his weapon fails to fire or if he should lose or break it. With a knowledge of hand-to-hand combat, and the confidence and aggressiveness to fight hand-to-hand, the Ranger is able to attack and dispose of his opponent. We teach hand-to-hand combat for several reasons. First, hand-to hand combat is an excellent physical conditioner and body toughener. Second, it builds a spirit of aggressiveness in the individual soldier and instills in him the will to fight. Third, it instills confidence in the student's own ability and that of his fellow Rangers. Fourth, hand-to-hand combat teaches the Ranger techniques of fighting or defending himself when unarmed and confronted with an armed opponent. And finally, our instruction in hand-to-hand combat provides a basis for the Ranger student to properly set up training in hand-to-hand combat when he returns to his unit.

There are several fundamentals that we stress in our hand-to-hand combat training. The first of these is using your opponent's momentum to your own advantage. We teach the student not to match his strength against that of his opponent, but to set his opponent in motion so that he can use the fundamental of momentum. Secondly, we stress the use of maximum strength against maximum weakness.

The Ranger uses his hand, arm and body against his opponent's weakest point--the wrist. Third, we stress the use of any and all available weapons. The Ranger student learns that there are no rules in hand-to-hand combat. He is taught to use whatever means are available to kill or maim his opponent. If the Ranger has nothing but his hands, he is far from defenseless. Every throw, hold or takedown is followed by a killing blow with the hand or foot.

Next, we stress a good balanced position. This position is merely a modified boxer's crouch. Weight is evenly distributed over the body. The hands are carried high to protect the face and ready to deliver a sharp killing blow or to execute a throw or takedown. This is the Ranger's physical balance or "on guard" position.

We encourage the Ranger student to use the growl because it upsets his opponent's mental balance, immediately puts him on the defensive and allows the Ranger to gain a mental advantage.

A final fundamental that we encourage the Ranger to develop is accuracy and speed. With emphasis on the fundamentals, the student will develop accuracy. Speed will come with practice.

Throughout the Fort Benning phase of training, the Ranger student is taught throws, take-downs, counters and holds.

PUGIL STICK

Bayonet training at times becomes dull, repetitious and unrealistic. The training of a bayonet fighter should be varied to keep up his interest and enthusiasm. The pugil stick can be used as a means of doing this. The pugil stick is a very effective training device and is used as a substitute for the rifle in bayonet training.

The pugil stick:

1. Weighs 4 3/4 pounds.

2. Has an overall length of 60 inches -- the same as a rifle with the bayonet fixed.

3. Has a stick that is approximately 2 inches in diameter.

4. Has a 5 1/2" x 10" pad attached to both ends.

5. Requires the following materials: one broom handle-type stick 44 inches long, several pieces of scrap canvas, carpet tacks, and filling from a salvaged mattress or cotton pad.

The movements with the pugil stick are executed in the same manner as rifle movements. For the "on guard" position you grip the stick by placing the right hand on the stick near the pad marked "Butt." The left hand is placed higher on the stick in the same manner that you would place it on the upper hand guard of the rifle. To prevent injury to the eyes, head, nose and ears we wear the softball catcher's mask. A football helmet, lacrosse helmet, or a boxer's head-guard may also be used. In the event you are not able to get enough of one item to outfit your men, a combination of all four will alleviate the situation.

A competitive-type bout can be arranged by separating your men into groups of threes. Two of the men are contestants and the third acts as a judge or referee. The bout is conducted as follows:

1. Each contestant arms himself with a pugil stick and a head protector.

2. The judge has the opponents face each other and take three paces backward.

3. Both men then draw a line on the ground to mark the limits of the area to be used for the bout.

4. The contestants must stay within the lines during the bout and they are penalized one point if they step outside or over the line. This is to make the timid or the non-aggressive men stand their ground and fight.

5. To score a point, a contestant must land a solid blow to the head, neck, stomach or groin with either end of the pugil stick.

6. A hit on the arm, leg, or in the side does not count as a kill.

7. Only solid blows are scoring blows.

8. Both hands must be kept on the pugil stick at all times, just as they would be on a rifle.

9. The judge commands "on guard" to start the bout.

10. The judge must be active and keep himself in a position to observe and control the bout properly. This will require that he move about rapidly.

11. Whenever one of the contestants lands a blow in the scoring area, the referee yells "point" or "score" and has them separate.

12. The bout lasts three rounds and the winner of two out of the three rounds is the victor.

13. After the winner has been declared, the positions are rotated until all men have had a chance to compete against one another and to serve as judge.

You can develop teamwork among your men by altering the bouts. You can have two men compete against one:

1. As the two men come within bayonet range, one will be initially engaged by the enemy.

2. The man that is engaged first moves in with a frontal attack.

3. The man that is not engaged moves in until he is on the flank of the enemy, or to his rear, and turns sharply and strikes the enemy's exposed flank or rear.

One man can easily defend himself against two by employing the following techniques:

1. As soon as the two enemy soldiers confront the single man, he should dart to one flank or another.

2. He cannot permit himself to be caught between the two.

3. He must concentrate on killing one at a time.

4. He must keep the enemy nearest him between him and the enemy farthest from him.

Hand-to-hand combat teaches the Ranger to be alert and aggressive and to have confidence in himself, in his ability to close with an enemy and, regardless of weapon, overcome that enemy.

RAPPELLING

Rappelling, or the technique of descending a vertical surface, is taught in the Ranger Course for several reasons. First, it helps the student overcome an inherent fear of height. Secondly, it builds confidence in the individual. And thirdly, it teaches the Ranger an additional military skill. He learns again that there is virtually no impassable terrain for determined, well-trained and well-led Infantrymen.

The Swiss Seat rappel is the type most often used by professional mountaineers. To get into the Swiss Seat rappel, the Ranger holds an eight - to twelve-foot length of manila rope across the small of the back. For a right-handed man, the rope in his right hand will be twelve inches shorter than that in his left. The ropes are then crossed in his crotch and brought up under the fleshy part of his buttocks, and then tied off over his left hip using a square knot and half-hitching the ends. A snap link of aluminum alloy or steel with a tensile strength of 2000 pounds is passed through all three ropes in the crotch with the hook up and the gate toward the user. The gate is a spring-loaded gate and must be checked before each use. The Ranger then faces the nylon climbing rope with the anchor point on his left and runs the climbing rope down through the snap link and under and back through the snap link a second time. To descend, the Ranger faces the anchor point and merely walks backwards down the cliff.

The climbing rope is 100% nylon, 120 feet in length, and has a tensile strength, when new, of 4000 pounds. An outstanding characteristic of this rope is its elasticity. It will stretch up to one third of its length before breaking. Heavy leather gloves are worn in this rappel, as they are in all the others, to prevent rope burns to the hands.

In many cases it will be necessary to haul personnel or equipment up a vertical surface. For such a purpose the Ranger student is taught the use of the vertical haul line. It consists of a heavy "A" frame constructed and lashed together at the top of the cliff, and sufficient climbing rope to reach the bottom. The Ranger engages his snap link with a butterfly knot and as he climbs the knotted rope, assisted by the men at the bottom, another butterfly knot moves down where the second man hooks up and climbs to the top.

The Ranger student is taught three types of rappelling. The hasty rappel is used for very short distances, and we usually prefer to use it on an inclined slope, although it may be used for vertical descents over short distances.

To stop his descent the Ranger brings his leading arm across his chest. To continue down after stopping, he plays the rope through the fingers of his leading hand to prevent the rope from knotting. His upper arm does not support his weight but merely stablizes his descent. The nylon rope is termed a "hot rope" by virtue of the extreme amount of friction generated between the rope and clothing. For this reason padding should be worn by the Ranger when using the hasty rappel.

The Ranger commands "on rappel" before descending, and "off rappel" after touching down and clearing his rope. The term "on rappel" signifies that he is about to descend, and for anyone below to be on the lookout for falling debris or rocks. The term "off rappel" means that the Ranger has touched down, that his climbing rope is clear and that the next man may descend.

The next rappel is the body rappel, which is suitable for descending over relatively long distances. You will note that the Ranger proceeds down by taking short side-steps to his right. The left hand does not support or hold the Ranger's weight, but serves only as a guide hand to stabilize his descent. The right hand controls the rate of descent and the breaking procedure is the same as in the hasty rappel. The descent is rather slow. Again this is understandable when you consider the amount of rope friction on his body.

A modification of the Swiss Seat rappel is the shoulder Swiss Seat rappel. This rappel is used when the individual is carrying a heavy load on his back such as boxes of ammunition or a machinegun. The climbing rope is passed over the shoulder, thus allowing for the heavy load and the change in the center of gravity. This modification of the Swiss Seat prevents the Ranger from toppling over backward due to the load he might be carrying.

In many cases the soldier is confronted with the problem of moving heavy equipment across deep ravines, mountainous terrain or mountain streams. In addition to the vertical haul line, the Ranger student is taught the suspension traverse. It is merely a rope so positioned as to bridge very difficult terrain. Loads may be transported up and down the traverse by means of the belay ropes attached to the load to control the rate of descent.

A technique for evacuating seriously wounded or stretcher cases is also taught the Ranger student in his mountain phase of training. Rappelling is serious business. Evacuating a wounded soldier down a vertical surface is extremely serious and requires exceptional teamwork.

The wounded individual is secured to the stretcher by the use of several sling ropes. Two saplings of approximately eight to ten feet in length are cut and attached to the stretcher to assist

in guiding it to the bottom. The team moves down, one on each side of the stretcher, and both in a position to administer to the patient. Again a belay rope attached to the stretcher controls the stretcher's rate of descent; the rope is belayed by an individual at the top on the command of the team leader. On the command "tension," belay of the stretcher is stopped, the rappelling team may tie-off if necessary and may take a short respite or administer to the wounded man. On the command "slack" the rope is belayed slowly and movement down the cliff continues. It is important that only one man pass the commands to the top. As the team touches down, tension is again taken on the belay rope as the two Rangers free themselves from the climbing rope. On the command "slack all the way," the belay rope is released and the litter patient is evacuated from the cliff.

In the event a soldier is lightly wounded and a stretcher is not available, another technique of evacuation is taught the Ranger student. This method is called the "piggy-back" evacuation.

The patient is secured to the Ranger by means of a sling rope and as the term implies, rides piggy-back fashion down the face of the cliff. The Ranger uses the Swiss Seat rappel and may tie-off to take a smoke break or adjust the weight of the man on his back.

To gain confidence in himself and his climbing equipment, the Ranger student is taught to lean back off the lip of the cliff and, keeping his feet flat against the surface, literally walk down backward. With experience the Ranger gains confidence in his ability and his equipment and is capable of making a more speedy descent.

RANGER ORIENTATION CONFIDENCE TESTS

A soldier fights four opponents; the weather, the terrain, the enemy and himself. In the Ranger Course, we place the student in situations and on terrain that will tax his capabilities to the maximum, and which require him to fight these four opponents in order to accomplish the assigned mission. He is required to operate effectively in all types of weather and over the most difficult terrain available. He is constantly harassed by an aggressor enemy whose tactics and techniques approximate those of an actual enemy. In spite of all this, however, we feel that the fight within himself, the fear of being afraid which every soldier faces in battle, is lacking to a degree. To inject this element of fear the Ranger Department has developed special tests.

These tests are a prerequisite to successful completion of the course and are so designed that meeting their demands successfully does not depend on an individual's physical strength. They are within the capabilities of practically any individual once he realizes that his physical abilities are greater than he thought they were. Strong men have failed because of uncontrolled fear. Weak men have succeeded because they have been confident, controlled their fear and have demonstrated the necessary willpower. In essence, each test is a challenge to be met, and by meeting it the student takes a big step in building his own self-confidence. The tests are not difficult. They merely appear difficult due to an inherent fear of height, a fear of being hurt, and a fear of the unknown. In order to insure maximum effectiveness, each test is conducted at the end of a particularly long and arduous patrol. This means that the test comes when the student is extremely fatigued, both in mind and body, and when his self-confidence is at its lowest ebb. Experience has shown that upon successful completion of these tests the student shows a marked increase in self-confidence and esprit.

The first of these tests is the rope drop, which is conducted during the Florida phase of training. The test consists of climbing a vertical pole, walking a 60-foot trestle suspended some 35 feet over water, climbing a short rope to another horizontal rope, monkey-crawling this rope to a predesignated point and, on order, dropping 45 feet into the water.

The second of these tests is conducted during the mountain phase of training and is called the "death slide." This test consists of climbing a swaying rope ladder to a platform suspended 90 feet in the air; hooking a cable block to a steel cable; sliding down the cable and, on command, dropping into the water. (At this time a demonstration of the "death slide" is conducted.)

Section II. RIFLE SQUAD AND PLATOON TACTICS

CAPTAIN KENNETH G. CASSELS

Instructor, Defensive Committee, Ranger Department

CAPTAIN WILLIAM R. PERRY

Instructor, Patrolling Committee, Ranger Department

Welcome to the rifle squad and platoon portion of the Ranger Department's presentations.

This instruction ties in closely with periods of instruction that you have received from the Command and Staff Department relative to company and battle group tactics.

My orientation will include the employment of the rifle squads and platoon as currently organized, in offensive and defensive tactics. Captain Perry will give a brief orientation on patrolling, evasion and escape techniques. At the end of the presentation, a panel, composed of officers from the Ranger Department, will entertain questions that you have relative to platoon tactics.

First, let us consider the new organization of the rifle company.

RIFLE COMPANY ORGANIZATION

Under this organization the company consists of a company headquarters, three rifle platoons and a weapons platoon.

Recent changes in the organization and equipment within the rifle platoons have resulted in minor revisions in offensive and defensive tactics and techniques. These changes have increased the ability of the rifle platoons to accomplish their mission. The mission of the rifle platoon in offensive action is still to close with the enemy by means of fire and maneuver in order to destroy or capture him.

RIFLE PLATOON AND SQUAD ORGANIZATION

The rifle platoon consists of 1 officer and 43 enlisted men. The platoon headquarters is composed of the platoon leader and the platoon sergeant. The platoon has three rifle squads and a weapons squad, each commanded by an E-6.

The messenger and one rocket launcher team have been eliminated from the organization of the platoon. The rifle squad is composed of 11 men, a squad leader and two fire teams. The fire team leaders are fighter leaders. In combat they assist the squad leader by initiating actions directed by the squad leader and by setting the example for the team members. Each team has an automatic rifleman who is armed with an M14 rifle modified to include a bypod, and three riflemen. The weapons squad is organized into two M60 machinegun teams, a rocket launcher team and the ammunition bearers. The gunners and assistant gunners of each team are armed with the .45 caliber pistol.

All personnel other than the gunners and assistant gunners and the automatic riflemen are armed with the M14 semi-automatic rifle.

The weight of the machinegun, 7.62mm, M60, as compared with the .30 caliber light machinegun, has been greatly reduced, and its characteristics make it possible for the machinegunners to keep pace with the attacking rifle squads when required. However, the machineguns are normally placed in firing positions on the ground during the attack so that the gunners might deliver close and continuous fire support to the rifle squads.

The twenty-round magazine of the 7.62mm semiautomatic weapon increases the capability of the riflemen of the platoon to deliver a heavier volume of fire, because it does not necessitate as frequent reloading. This characteristic is particularly desirable during the assault phase of the attack.

PLATOON RADIO NET

The rifle platoon now has an organic radio net which utilizes the AN/PRC-6 radio. This net is composed of the platoon leader, platoon sergeant, and rifle and weapons squad leaders. This net increases the flexibility of the platoon and will allow greater dispersion of the platoon than in the past. It will greatly facilitate control and speed up the reaction time of the squad leaders. It will also alleviate somewhat the necessity for leaders to expose themselves to hostile fire during the conduct of the attack.

The platoon leader also has an AN/PRC-10 radio in the company command net. Until a lightweight radio or combination of radios is adopted, it will be necessary for the platoon leader to carry the radios or designate a rifleman as his radio operator. In addition to the equipment mentioned, the platoon has radiac meters for monitoring radiation and a metascope for night operations.

On the battlefield it will be necessary to move the unit tactically from one position to another. Combat formations for the squad and platoon are designed for efficient tactical employment of these units.

The rifle squad has three basic formations:

1. The squad column is the basic formation for movement. The squad column (fire teams in column) facilitates fire and maneuver because the leading fire team can immediately engage the enemy while the trailing team is used to maneuver. ALFA or BRAVO team may be the lead element. When terrain and visibility permit, the squad leader may separate his fire teams, having the rear team follow at a specified distance. The distance is not so great, however, that the squad leader cannot have direct and immediate control over the rear team. When moving along roads, the squad column (fire teams abreast) may be used. Fire teams abreast will facilitate their employment on each side of the road since fire team integrity can be maintained without having personnel cross the road.

2. When visibility is so reduced that control becomes extremely difficult, the squad uses the squad file. Deployment of the squad from this formation is not as easy as from the squad column.

3. The basic assault formation for the rifle squad is the squad line. When moving into the line from another formation, the trailing fire team may be employed on either the right or the left of the lead fire team.

Platoon combat formations have changed only so far as the squad formations within the platoon formations have changed. These formations for the platoon are:

1. The platoon column is used when speed and control are governing factors. This formation is flexible, affords excellent control, and favors action to the flank. It does not provide as much all-around security as other formations.

2. The platoon wedge is used when the enemy situation is obscure and when the terrain and visibility demand dispersion.

3. The platoon vee is used when the enemy is believed to be directly to the front and his approximate strength and location are known. It provides excellent firepower to the front, facilitates movement into the platoon line formations, and may be used for crossing small open areas.

4. The platoon echelon is used to protect an open or exposed flank. It permits a heavy volume of fire to the front and in the direction of the echelon. It is difficult to control and is slow, especially under conditions of poor visibility.

5. The platoon line is used during the assault phase or for crossing short exposed areas. It provides maximum concentration of fire to the front, but is difficult to control.

As depicted graphically, the combat formations for the platoon consisted of the platoon column, wedge, vee, echelon, and line. Plans for movement will always include one of the combat formations. Planning will always be emphasized; but there will be occasions when, because of a rapidly changing situation, we will not be able to plan for every eventuality.

During the conduct of the attack, when a small unit is faced with an unexpected enemy situation which makes the original plan of attack either invalid or incomplete, battle drill is used. Battle drill is the rapid application of fire and maneuver through the elimination of lengthy oral orders. The unit leader must make an estimate of the situation to determine which battle drill maneuver is appropriate.

Battle drill certainly is not new, but it has been standardized so that all units will use the same battle drill in their training.

For the squad there are three battle drill maneuvers: Maneuver left, maneuver right and frontal attack. There are also three platoon battle drill maneuvers: Maneuver right, maneuver left or frontal attack.

The platoon radio net greatly aids in the execution of battle drill, allowing the platoon leader to control the base of fire element and the maneuver element, thus closely coordinating their efforts on the objective.

The present rifle platoon can be used as the basis for small task force organization. It can be transported by personnel carriers or helicopters. It will normally attack as part of a coordinated company action, although when given necessary attachments, it may be employed as a semi-independent force for short periods of time.

The organization and equipment of the rifle platoon has not greatly affected the tactical employment of the platoon. It can seize and hold terrain by maneuvering in all types of terrain and climatic conditions. It can form the base of fire or be used as a maneuvering element. It can participate as an air-landed force in an airborne assault or form an Infantry tank team in a mechanized attack.

No matter what mode of transport or supporting fires is utilized by the rifle platoon, it must fight on foot for the last few meters onto the objective.

It is not likely that a unit will remain on the offensive indefinitely; it will be necessary for units to be employed in a defensive role from time to time. Let us begin our discussion of the squads and platoon in defensive combat by first reviewing the mission of the parent unit.

Regardless of the type of defense being conducted by the larger force, the mission of the rifle company in defense is to stop the enemy by fire forward of the battle area, to repel him by close combat should he reach the battle area, and to, within its capability, destroy and eject the enemy by counterattack should he penetrate the battle area.

Because the forward rifle platoon normally does not withhold a reserve element, it retains only the first two parts of the mission assigned the rifle company; to stop the enemy by fire forward of the battle area and to repel him by close combat should he reach the battle area. If the enemy succeeds in penetrating the battle area he must be ejected either by the reserve platoon of the forward rifle company or by the battle group "reserve."

RIFLE COMPANY DEFENSE

The rifle company commander assigns the forward rifle platoon an area to organize and defend based upon the mission, the enemy, the natural defensive strength of the terrain, and the effective strength of the platoon. The platoon will not normally physically occupy all of its assigned area and will cover the unoccupied portions by observation and fire.

With the introduction of a new family of more effective Infantry weapons and night viewing devices, the unoccupied gaps between platoons and companies has been increased. As a guide figure, an unoccupied gap of 300 meters (+ or -) may exist between the two forward platoons with an unoccupied gap of 450 meters (+ or -) on the flanks of the forward platoons.

RIFLE PLATOON DEFENSE

To best accomplish the mission assigned the forward platoon, all three rifle squads, reinforced by elements of the weapons squad, are deployed generally abreast along the FEBA so that the maximum fire can be placed in the area from which the enemy attack is expected. As a guide figure, the area physically occupied by the rifle platoon is 400 meters (+ or -). The depth of the platoon is determined by the distance from the primary positions to the squad supplementary positions and may vary up to 200 meters (+ or -).

Gaps are not normally planned between the rifle squads; however, when there are two significant terrain features within the platoon area, two squads may be located on one terrain feature and the other squad on the remaining terrain feature. The width of the area to be physically occupied by the rifle squad is determined by the effective strength of the squad, the availability of observation and fields of fire and the ability of the squad leader to control his men.

RIFLE SQUAD DEFENSE

This width is approximately 100 meters (+ or -) for the organic rifle squad. Approximately 25 meters is allowed for each crew-served weapon employed within the rifle squad area. The interval between foxholes varies with the terrain and whether single or double foxholes are used. The use of double foxholes is more desirable in that it provides for continuous observation and raises morale.

Within each rifle squad, fire team integrity is maintained when possible, with each fire team occupying about half of the assigned squad area. The fire team leaders are located in the line of riflemen, where they can best control the actions of their fire teams. The rifle squad leader will position himself where he can best control the actions of the squad.

Supplementary squad positions are selected and prepared to permit all-around defense of the platoon area.

PLATOON FIRE PLAN

The platoon leader, in preparing his fire plan, familiarizes himself with the company fire plan as it affects the defense of the platoon area. He uses a map or overlay, or makes a sketch showing the location and designated numbers of artillery and mortar concentrations and barrages in his platoon area. Normally, one 81mm forward observer will operate in the platoon area and will assist the platoon leader in planning and calling for fires. When time and facilities permit, the platoon leader issues this information to his squad leaders. The platoon leader coordinates the fires of the rifle squads and attached weapons with the company fire support plan to provide the maximum defense of the platoon area.

The forward rifle platoon distributes its fire to cover the front and flanks and to facilitate mutual support between adjacent units. Each rifle squad is assigned a sector of fire which overlaps with the adjacent squad, and when possible, overlaps with adjacent units.

The platoon machineguns are positioned on the FEBA to cover the most likely avenue of enemy foot approach into the positions, or to comply with instructions by the company commander, such as covering the gaps between platoons or mutually supporting adjacent units. While it is more desirable to employ the machineguns in pairs to provide for continuity of fire and to facilitate control, the frontage assigned and the military aspects of the terrain normally require the guns to be employed singly. The platoon leader selects the general firing location and assigns each gun a sector of fire, a final protective line and/or a principal direction of fire. The weapons squad leader will select the exact firing positions for each gun and point out the sector of fire and final protective line and/or sector of fire to the gunner.

The platoon rocket launcher provides close-in antitank protection for the platoon and is positioned within the platoon defensive area where it can best accomplish this mission. The platoon leader selects the general firing location and assigns a principal direction of fire. The weapons squad leader selects the exact firing position for the rocket launcher. The fires of the rocket launcher are closely coordinated with other antitank weapons employed within or nearby the platoon area. Alternate and supplementary positions are prepared. In the absence of armor targets, the rocket launcher may be effectively employed against grouped personnel and enemy crew-served weapons.

The squad leader selects the firing position of each rifleman, taking advantage of the available fields of fire and ensuring that the sector of fire overlaps with adjacent weapons. If specific missions have not been assigned the automatic rifles by the platoon leader, the squad leader selects the exact firing position and assigns a principal direction of fire and a sector of fire for the automatic rifles. The fires of the automatic rifles are coordinated with the fires of the machineguns and are placed to cover the likely enemy foot approaches into the squad area.

Fire control measures are included in the platoon leader's defense plan. The fires of weapons are coordinated with the use of mines, wire, obstacles, flares and field expedients. The use of field expedients such as fougasse, trip flares and noise making devices will greatly add to the effectiveness of the defense.

Authority to call for final protective fires is normally designated in the battle group defense order and this authority is normally delegated to the forward rifle platoon leaders to ensure that these fires are called for when needed.

The platoon leader selects a combined command and observation post where he can observe the major portion of the platoon front and flanks and best control the actions of the platoon. When the terrain dictates, an alternate CP-OP may be established and occupied by the platoon sergeant. From this position the platoon sergeant controls that portion of the platoon most difficult for the platoon leader to control from his own location.

During the conduct of the defense, the platoon leader controls his platoon by using his organic radio net. The CP-OP has a telephone in the company wire net. Additional means of communication include voice, arm-and-hand signals and prearranged signals. When more positive control is necessary within the platoon area, the platoon leader moves to the critical area as required by the situation.

The squad leader controls his squad primarily through the fire team leaders by oral and visual signals, and by personal contact. It is imperative that the squad leader anticipate difficulties in control and improvise expedients, such as having information and orders passed from foxhole to foxhole.

The platoon provides for its own security by constant observation to the front and flanks. Sufficient men are kept alert to provide an effective warning system. At night and during other periods of reduced visibility, additional security measures are necessary. Listening posts and patrols, coordinated by the company commander, are employed forward of, to the flanks and within the defensive position.

The reserve rifle platoon is normally positioned in rear of the forward platoons to provide depth to the company defense area. Through the use of the reserve, the company commander is able to influence the actions of the company, thereby adding flexibility to the defense.

The company commander assigns the reserve platoon a primary position and one or more supplementary positions. He further assigns the reserve one or more missions and states the priority of accomplishing each. Appropriate missions for the reserve are as follows:

1. Limit penetration.

2. Protect the company flanks and rear.

3. Support the forward platoons by fire.

4. Perform surveillance in the company rear area and provide security.

5. Participate in a counterattack.

The rifle company will normally be responsible for furnishing troops for the COPL and the reserve rifle platoon will be assigned this mission. While the platoon is on the COPL, the company commander has other elements of the company prepare reserve platoon positions if at all possible.

The organization of the reserve platoon position is generally the same as for a forward rifle platoon, except that machineguns are assigned a principal direction of fire and sectors in lieu of final protective lines. The entire platoon will normally occupy its primary position.

The position(s) to be occupied by the platoon is (are) designated by the company commander. The company commander may order the platoon to move from one position to another as required by the enemy situation.

Specific security and surveillance responsibilities of the reserve will normally be stated by the company commander. The reserve platoon may be required to establish outposts or listening posts forward or in rear of the area and in the gaps between forward platoons. It may be required to patrol throughout the company area and to maintain contact with adjacent units.

When the reserve platoon is assigned the mission of participating as the maneuver element in a counterattack, the platoon leader will assist the company commander in preparing the company plans as directed. Plans for a counterattack are essentially the same as for any attack.

Whether the mission be to attack or to defend, a requirement will exist for very active patrolling. Timely information gained from reconnaissance-type patrols will be invaluable, and certainly there will be missions for combat-type patrols.

The principles and techniques of patrolling have not changed. Whether it is a combat patrol or a reconnaissance patrol, the organization and size of the patrol will depend on the mission. Certainly the new family of light-weight weapons, such as the M14 rifle and the M60 machinegun, will make it possible for a patrol to deliver a greater volume of fire than it has in the past. Perhaps these changes will make it possible to accomplish a mission with fewer men and at greater distances. However, at this time there are no firm recommendations or changes to be made relative to patrolling.

Recently, evasion and escape training has received considerable emphasis and attention. To emphasize the need for this type of training, let us discuss some cold facts and figures which are part of the history of the Korean War.

During the Korean War there were some 7200 Americans captured and placed in permanent-type prisoner of war compounds. Of this total, 38% died while in captivity. This is the highest percentage of fatalities among American prisoners of war since the Revolutionary War. Let us look at the other side of the picture. During Operation Big and Little Switch 4500 Americans were returned to us. The Defense Department has estimated that approximately 50% of these people will never be able to lead a normal life again--either from mental deterioration or physical handicap which were direct results of their captivity.

The most startling fact of all is that not one American successfully escaped from a permanent prisoner of war camp in Korea. This is the first time in the history of our country that this happened.

Three-fourths of the prisoners in Korea reported that they had been captured while isolated. On the modern battlefield, isolation will be more prevalent than it has been in the past. Units will be deliberately deployed away from one another to keep from offering a lucrative nuclear target to the enemy. Our troops must be trained in such a way that they accept this isolation as normal to combat and that only by depending upon their own fighting strength and ability can they successfully accomplish their mission.

Nine-tenths of the Americans who were captured in Korea stated that they had over an hour before capture to take another course of action after being isolated. Actually the time varied from several hours to several days, and in one instance seven days. When cut-off behind enemy lines a commander or small unit leader has several courses of action open to him. These courses of action are:

1. To defend. Defense of present position may depend on probability of relief by friendly forces and the possibility of holding off the enemy and eventually forcing him to withdraw. This requires timely information of the enemy, adequate supply and resupply by air, and time to prepare and organize.

2. To breakout. Breakout to areas under friendly control necessitates prompt, decisive action. Success depends on leaders who act rapidly and skillfully to determine enemy weaknesses and strengths and catch the enemy off guard. The longer a breakout is delayed the more advantage passes to the enemy.

3. Deeper penetration. Penetrating deeper behind enemy lines to conduct guerrilla operations is a very aggressive course of action. This action, however, necessitates a knowledge of guerrilla operations and land survival. It in no way assumes the role of Special Forces but rather is a temporary arrangement until the group can regain contact with friendly forces.

4. Infiltration. Evasion by infiltration is the breaking down into small groups and slipping through enemy lines to regain contact with friendly forces. Even though the last resort if isolated is to divide a unit into small groups, there may be times when this becomes necessary. The main consideration is not to break up a unit prematurely. Because there are enemy troops to the rear does not necessarily mean a position is cut-off. Should infiltration in small groups become a necessity, all ammunition, food, and other supplies not needed should be destroyed. The leader divides the unit into three- to five-man groups; provides a leader for each group; gives each group a route and staggers departure times. These small groups should travel at night, during inclement weather and utilize the terrain that, due to its ruggedness, is quite possibly free of enemy personnel. Once friendly lines are reached, the evasion and escape route, and actions taken during evasion are highly classified and should be discussed only with the debriefing officer. The debriefing officer is furnished from intelligence channels.

We realize that not everyone will successfully evade. Some men will be captured. When a man is captured he becomes a "soldier of misfortune," but during his captivity escape should be the foremost thought in his mind. The best time to escape is in the combat zone, near the front lines. Here the individual is in the best physical condition that he will be in for a long time to come. He is oriented on the ground and is close to his own front lines. The battlefield confusion presents more opportunities for escape than in rear areas. Enemy guards close to the front lines may not be trained to handle prisoners of war, and usually there are not sufficient guards to do the job. We must impress our men that each step to the enemy's rear is another one to take to get back to friendly lines.

Successful evasion serves these purposes:

1. For humanitarian reasons, that is, it may save an individual's life.

2. To deny the enemy information, in that it keeps a man from being an interrogation suspect.

3. We secure information of the enemy from evaders who have passed through the enemy's front and rear areas. In effect the evader is a reconnaissance patrol.

4. Returns personnel to duty and thereby conserves manpower.

5. Improves the morale of a unit by having returned evaders present.

6. Other men will not feel as badly about the prospect of having to evade when they can see that it has been and can be done.

7. It places a strain on the enemy's internal security. The problem of evaders is a serious one, and the enemy will have to use a large number of troops to cope with the evaders.

Training in support of the Code of Conduct has been integrated whenever and wherever possible in problems here at the Infantry School. The training received by basic officer and officer candidate students begins with a two-hour class on survival with the emphasis placed on living off the land.

Three hours are devoted to training on the Code of Conduct where the students are shown training film # 21-2720, "Code of the Fighting Man," which emphasizes a soldier's responsibility

in regards to the Code of Conduct and resistance to interrogation. During this three-hour block the students are placed in a prisoner of war compound, harassed, humiliated and shown interrogation skits. The students are also introduced to an indoctrination program similar to that employed by the Communists in North Korea.

Upon conclusion of the prisoner of war compound phase, the students are moved to a tactical area. There they are placed in a defensive situation and plan and organize their evasion attempt. Full use of aggressor personnel is made over a five mile course, which the students must pas through to make contact with friendly elements where they are debriefed. Unfortunate or careless students who are captured are placed in a forward prisoner of war collection point and are subjected to interrogation and further humiliation and harassment.

In our evasion training we have found that this type training places the student in a strain, both mentally and physically. The course is over rugged terrain which tires the student physically, and the unknown creates the mental strain. But with training we build confidence in a man, whereby he knows that should the need ever arise he can successfully evade capture by keeping his head and remembering what he has learned here at the Infantry School.

That some men were captured in Korea when ways to avoid it existed, clearly indicates the necessity for evasion and escape training. Every other possible course of action is preferable to falling prisoner, and we must continually remind our troops that they are not free as individuals to choose to become a prisoner of war. If captured, we do not attain independent status as a prisoner of war. We are first, last and always American soldiers. Evasion and escape training must emphasize the positive approach to a basic problem -- the need to promote a determined, powerful, and pervading will to resist in each individual, and subsequently, each unit of the Army.

Section III. PHYSICAL COMBAT PROFICIENCY TEST DEVELOPMENT: RECENT CHANGES IN BAYONET AND MANUAL OF ARMS

LIEUTENANT COLONEL JAMES E. REILLY

Special Projects Officer, Ranger Department

The purpose of this presentation is two-fold:

1. To acquaint you with the objective and development of the new physical combat proficiency test.

2. To inform you of the changes in bayonet fighting and in the manual of arms which were made mandatory by the adoption of the M14 rifle for the Infantry.

PHYSICAL COMBAT PROFICIENCY TEST

In July 1958 a project was established for the development of a new physical fitness test for the Army. This new test would be valid, acceptable Army-wide and would replace the present fitness test. The current test has been utilized by the Army since 1944 and has undergone no major changes since its inception, although a revised scoring table was published in 1957. The test objective is to determine the strength and endurance of the major muscle groups of the body, those groups which will enable the soldier to accomplish his assigned combat missions. Although valid and successful with respect to its objective, the test possesses several aspects which have a tendency to limit wide and frequent usage. Some of these are:

1. The test events have a complete lack of combat relationship.

2. There is excessive human judgment in scoring the test.

3. Each event tests the individual to the point of exhaustion in an effort to obtain a passing score.

4. Too much attention is paid to manner of performance.

5. The test events are repetitious and monotonous.

All of these unfavorable aspects were carefully considered in the development of the new test to insure that they would not be repeated. Included also in initial research phases was a study of the current proficiency tests of the United States Air Force, the United States Navy, the United States Marine Corps and the British Army.

It was readily apparent that a suitable fitness criterion could be constructed if the following characteristics were incorporated:

1. The test events were founded on such basic combat skills as running, climbing, marching, throwing, crawling, jumping, leaping or swimming.

2. The test scores were obtained by measurement in terms of time or distance, or a combination of both, with human judgment reduced to the absolute minimum.

3. Inclusion of test events in which manner of performance is not a major factor in determination of final scores.

4. Avoidance of repetitious test events, such as pushups or squat jumps.

5. Selection of test events which do not require extensive facilities and expensive construction costs.

6. Inclusion of events which do not test to the point of exhaustion.

As a result of the exploratory research period, an objective was established for the new test. This objective was "a measure of individual physical proficiency for combat." During the World Wide Infantry Conference, conducted last December here at Fort Benning, an opportunity was presented to discuss the construction of the new test with experienced combat commanders. These senior officers approved developmental procedures and recommended that the finalized test battery consist of the following basic combat skills and test events:

Combat Skills	Test Event
Crawling	40-yard low crawl
Climbing	Horizontal ladder
Jumping	Triple standing broad jump
Throwing	Hand grenade throw
Running	One-mile run

In accordance with the guidance obtained, an experimental test battery was prepared. During January of this year the battery was administered to 713 basic trainees from Second Infantry Division. Three rifle companies and two mortar batteries were each tested twice. Ten days to two weeks separated the first and second tests, all of which were conducted under varying conditions of weather and temperature.

The analysis of test statistics and examinee questionnaires indicated that developmental procedures, coupled with the Infantry Conference guidance, had evolved a test battery which possessed the characteristics of a valid and acceptable test. Certain conclusions were drawn from statistical analysis:

1. Test reliability. Reliability was indicated by a comparison of first and second test results. Administration of the test battery twice under different conditions of weather and temperature resulted in uniformly consistent performance; always a firm indication of reliability.

2. Effect of height and weight. Body height and weight had no appreciable consistent effect upon test performance; large, heavy trainees scored as well as did the smaller, lighter trainees. You may recall that these factors of height and weight exert considerable influence upon scores resulting from the present fitness test.

3. Measurement of performance. The performance graphs showed that all ranges of performance, from low to high, can readily be measured. Consequently, troops in poor physical condition are easily separated from those in good condition.

4. Measurement of body characteristics. Each test event measured a different body characteristic; duplication of effort was avoided.

Examinee questionnaires provided the answer to test acceptability by such majority opinions as:

1. Strong endorsement of the test battery.

2. Desirability of the new test, as opposed to the present test.

3. Approval of the test events which were designed to eliminate repetition.

4. Satisfaction with the combat relationship of the test events, except the triple standing broad jump, wherein no relationship was evident.

As a result of the first test period, several modifications were incorporated in the test battery; the triple standing broad jump was replaced by the dodge run and ditch jump, and a new target layout and scoring system were prepared for the grenade throw.

The modified battery was tested last April by troop support forces and the staff and faculty of U. S. Army Infantry School. A total of 1196 officers and enlisted men from combat arms and support and service units, and 100 officers from the School staff and faculty were tested once only. All ranks from private to Lt Colonel were included in the test phase.

The results in the second phase confirmed the conclusions of the January tests and added the following data:

1. Officers as a group performed better than noncommissioned officers and, in some events, better than enlisted personnel below the first three grades.

2. The dodge run and ditch jump is an effective substitute for the triple standing broad jump and far more combat related.

3. The test directions are clear and easily understandable; questions regarding manner of performance were a rarity.

4. The one-mile run is the most popular test event; the 40-yard low crawl is least popular.

Figure 1. The 40-Yard Low Crawl.

Above is an illustration of the proposed test's first event, the 40-yard low crawl (Figure 1). This event tests the ability to crawl and is a measure of an individual's endurance. Examinees crawl the length of the course using only the elbows, knees and feet. As they near the end line they touch it, spin on their stomachs and return to the starting line. This is a timed event.

Next is an illustration of the horizontal ladder (Figure 2). In this event the examinees begin with both hands on the first rung and move forward by alternating their hands on successive rungs. When they reach the end of the ladder they turn and start back, making as many round trips as possible in the time limit of one minute. General body coordination and shoulder girdle muscular development are measured by this event.

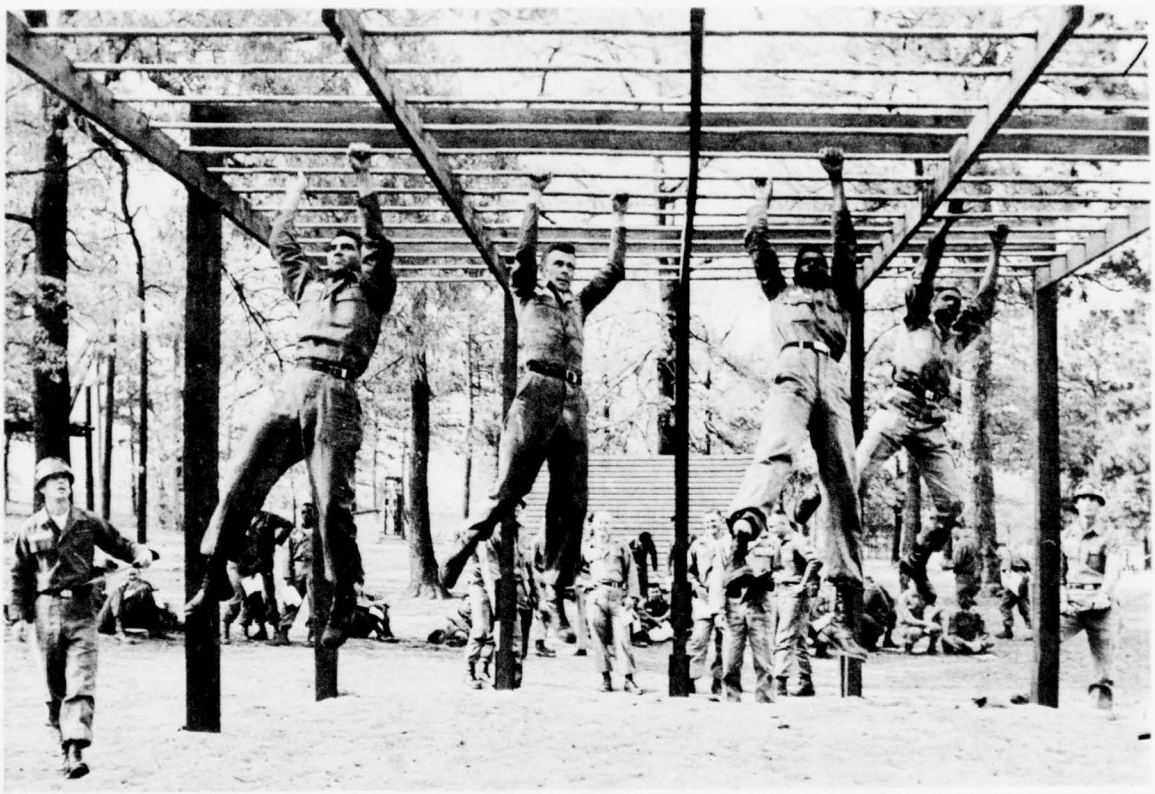


Figure 2. The Horizontal Ladder.

The next event is the dodge run and ditch jump (Figure 3). At the starting signal the examinees follow the directional arrows and run between the obstacles, jump the ditch, run the last obstacles and then return. Two circuits of the course are required for completion. This event is a measure of individual ability to change direction rapidly and to jump. The entire distance totals fifty-eight yards and hence is not a test of endurance.

The fourth test event is the grenade throw (Figure 4). This event measures the ability to throw accurately and for distance. Examinees are taken for a close look at the target area and then are moved back of the throwing line, which is ninety feet from the center of the target. Each examinee throws seven grenades, two of which are for practice and the last five for record. The prone position is starting position; examinees rise to a kneeling position, throw and immediately return to the starting position.

Figure 3. Dodge Run and Jump.

Figure 4. Grenade Throw.

Figure 5. One-Mile Run

The last event is the one-mile run (Figure 5). It is run on a quarter mile oval laid out on a grassy area. Two groups of 36 examinees each are run simultaneously from opposite sides of the oval. Each examinee wears a numbered card; different colored card backgrounds separate the running groups to facilitate scoring. This event tests endurance and ability to make a prolonged run.

The entire test battery can be administered to 200 troops in a period of 2 1/2 to 3 hours.

The field test phase of this project began on 1 July 1959. Approximately 10,000 troops in the Third and Fifth United States Army areas will be tested. All ranks from private to Lt Colonel will be included, with age forty the maximum age tested. Nine thousand of the test troops will be from combat arms and support and service units typical of a type field army; 1000 will be basic trainees. The field test period ends 1 October 1959.

A final project report will be submitted to Continental Army Command in Jan 1960. This report will include recommendations for adoption and utilization of the new test on a periodic basis for male Army personnel who have not attained their forty-first birthday.

This concludes the physical combat proficiency test portion of the presentation.

BAYONET TECHNIQUES FOR M14 RIFLE

Early this year a study was begun to determine what changes in bayonet fighting techniques were necessitated by adoption of the M14 rifle for the Infantry. The first consideration was the differences in the M1 and M14 rifle from the standpoint of the bayonet fighter. Essentially, these were three in number:

1. The M14 is approximately one pound lighter than the M1.

2. The M14 has only half the wooden handling surface on the upper hand guard area of the stock.

3. The hand guard, trigger housing and receiver of the M14 fit together more loosely than the corresponding parts of the M1.

The M14 rifle was extensively tested in present bayonet positions; movements and series, both the thrusts and the butt strokes; the thrusting dummy course and the bayonet assault course. It was subjected to the same rough usage and handling of which the M1 is capable. The results of all field testing have clearly indicated that the M14 rifle is just as sturdy structurally as the M1 and that all bayonet positions, movements and offensive series now effective for the M1 are equally effective for the M14.

MANUAL OF ARMS FOR THE M14 RIFLE

The adoption of the M14 rifle has necessitated several changes in the manual of arms. The changes are caused by the following differences in construction between the M14 and the M1:

1. The M14 has no stacking swivel.

2. The lack of wooden upper handling surface mentioned previously.

3. The use of a magazine for cartridges instead of a clip.

Changes to the manual of arms are centered in three areas.

1. The rest positions.

2. Inspection arms.

3. Stack arms.

When the commands of parade rest and stand at ease are given to troops armed with the M14 rifle, the weapon will rest against the right leg and along the seam of the trousers as in the position of attention, with the grasp of the rifle unchanged. On the commands of at ease or rest, the position of the rifle is the same as parade rest.

At the command of inspection arms for troops armed with the M14, the left hand holds the weapon at the balance while the right hand forces the bolt to the rear. Without a magazine inserted the right thumb is placed on the side of the rifle opposite the operating rod handle; the bolt lock is depressed by the thumb to keep the bolt in a rearward position. With a magazine inserted, the magazine follower will engage the bolt and keep it in a rearward position.

Stacking of arms with the M14 rifle will be accomplished by using the rifle sling. A change to FM 22-5, reflecting this new manual of arms, has been prepared and will be published in the near future.

CHAPTER 5
COMMUNICATION DEPARTMENT PRESENTATION

Section I. INTRODUCTION

COLONEL JULIAN H. MARTIN
Director, Communication Department

We are particularly pleased to have this opportunity to discuss with you matters relating to Infantry communication. I am sure that you recognize the importance of communication to the success of Infantry operations. If we are to be as dispersed and move with the rapidity which our concept dictates, and if we are to effectively utilize the firepower which is provided, we must have the required communication means immediately available and responsive to the commander.

Recently, we believe we have had more success toward improving and providing adequate communications for Infantry than has been the case in a considerable period of time. This does not mean that we are satisfied and that the ultimate has been obtained. We are not satisfied and will continue to strive for improvements. It is in the development of improvements that we need all the assistance we can get. We need you, for in your daily associations at your duty stations you come into contact with individuals who may be working on communications problems or problems affecting communications. It may well be that these problems which are of concern to them may have considerations having equal application to Infantry communications. You may have a helpful suggestion. When you have information or an idea which you think will be helpful, let us have it. The means by which you get the information to us is not too important. The most important thing is for us to receive the idea. All of us in the Infantry have a responsibility to emphasize the importance and necessity for adequate communications. Without your assistance and without ideas from the field, our job is most difficult. All of us working together can insure that Infantry has the communication it requires.

At this time I would like to introduce Major Van Dyke, Research Coordinator, Communication Department, who will discuss the communications which the Infantry battle group is provided under the draft "D" series TOEs prepared by USCONARC to support the reorganization directed by Department of the Army, 28 Dec 1958, and the status of new equipment, to include the display of some actual and mock-up equipment under development.

Section II. INFANTRY BATTLE GROUP COMMUNICATION

MAJOR WILLIAM A. VAN DYKE

Research Coordinator, Communication Department

At the last Infantry Instructors' Conference, the United States Army Infantry School position on battle group communications was presented to the conferees. The Infantry School position, after revision, was presented to the World-Wide Infantry Conference held here at Fort Benning in December 1958. The conferees endorsed the position without exception, and recommended that Department of the Army take immediate action to revise appropriate TOEs in consonance therewith. I heartily recommend that you take a look at the World-Wide Infantry Conference report, a copy of which is available at your installation, if you have not already had the opportunity.

The recommendations contained in the Infantry School position on battle group communications were forwarded to USCONARC for incorporation into draft TOEs developed by USCONARC to support the reorganization directed by Department of the Army in Dec 1958. A great majority of the improvements recommended in the Infantry School position were incorporated into the draft "D" series TOEs; however, some were not initially incorporated. We have, subsequent to the receipt of initial drafts, to the greatest extent possible, continued our efforts to have all recommendations contained in the Infantry School position incorporated in the TOE prior to finalization by Department of the Army.

I would like now to show you the highlights of what the draft TOEs, as we know them, provide for the battle group communication system (Figure 1).

The rifle platoon leader will be provided with 6 organic radio sets, AN/PRC-6, 1 1/2-kilometer range, with which to establish a platoon net to control his widely dispersed squads. Distribution of these sets includes the platoon leader, the platoon sergeant, and each squad leader. This is considered to be an interim measure only, pending the availability of more improved, lighter weight equipment. For communication back to company, the AN/PRC-10 radio is provided to the platoon leader. This radio set, with a 5- to 8-kilometer range, will fill a realistic range requirement at this level. Thus two radio sets are provided the platoon leader (Figure 2), the AN/PRC-6 for communicating with squad leaders and (Figure 3) the AN/PRC-10 for communicating back to company. Both of these sets must be carried by the platoon leader since the TOE provides neither radiotelephone operators nor messengers for the rifle platoon. The draft "D" series TOE provides one telephone, sound power, for use by the platoon in the rifle company wire system.

The rifle company weapons platoon is provided with eight AN/PRC-10 radio sets. Two of these are used by the antitank squads, and the other six by the weapons platoon headquarters and the 81mm mortar section. Allocation of these sets provides one AN/PRC-10 for each forward observer; two for use by the fire direction center, one of which is for displacement purposes; and one for communication in the company command net (Figure 4). A radiotelephone operator is provided for the weapons platoon headquarters, each of the forward observers, and the fire direction center. Additional wire equipment, radio remote control units, and telephones with headsets to allow fire direction center personnel free use of both hands are also provided this unit.

Now let us take a look at what has been provided the rifle company commander to control his unit (Figure 5). The AN/PRC-10 radio has been provided for use within the company command net. One of these same type radios is provided to each of the following: the company command post, the company commander for dismounted use, the company observation post, the two antitank squads mentioned previously, the weapons platoon and each rifle platoon. The heavy mortar forward observer from the heavy mortar platoon is provided a like set so that he

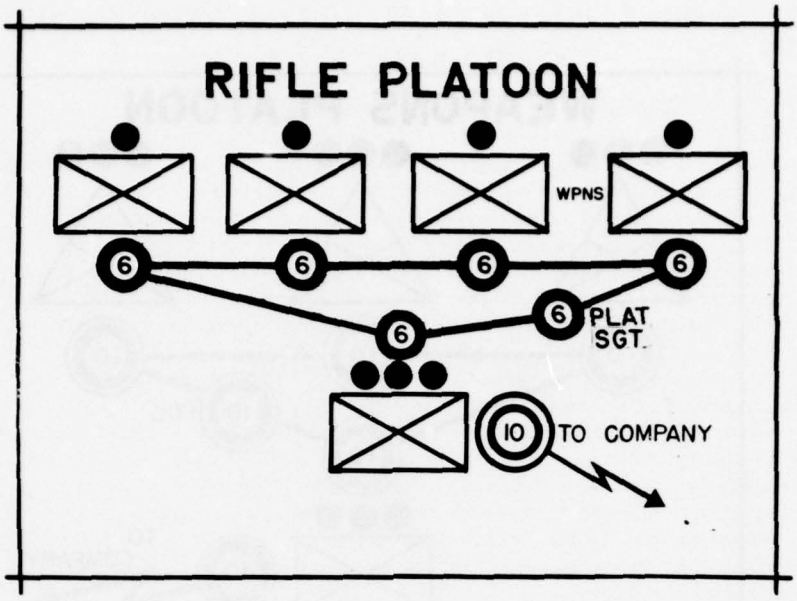


Figure 1. Rifle Platoon Radio Net.

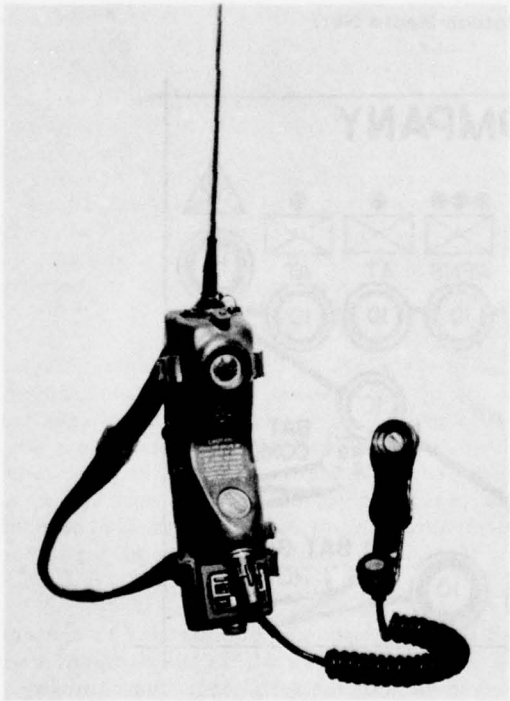


Figure 2. AN/PRC-6 Radio Set (Figure 3, Comm Data).

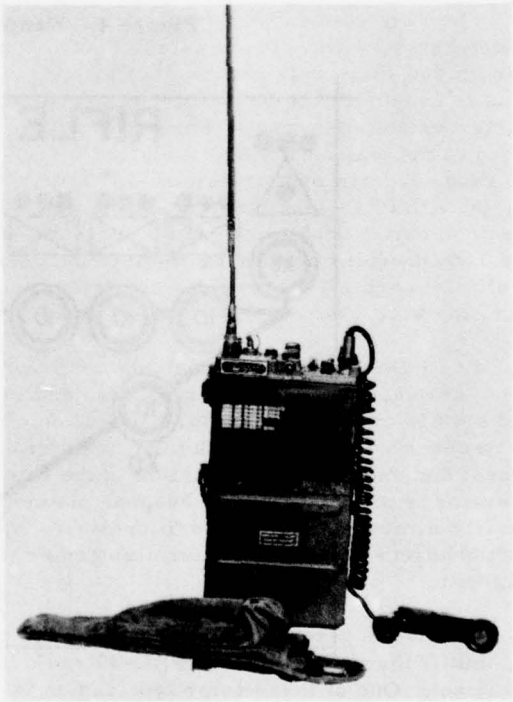


Figure 3. AN/PRC-10 Radio Set (Figure 8, Comm Data).

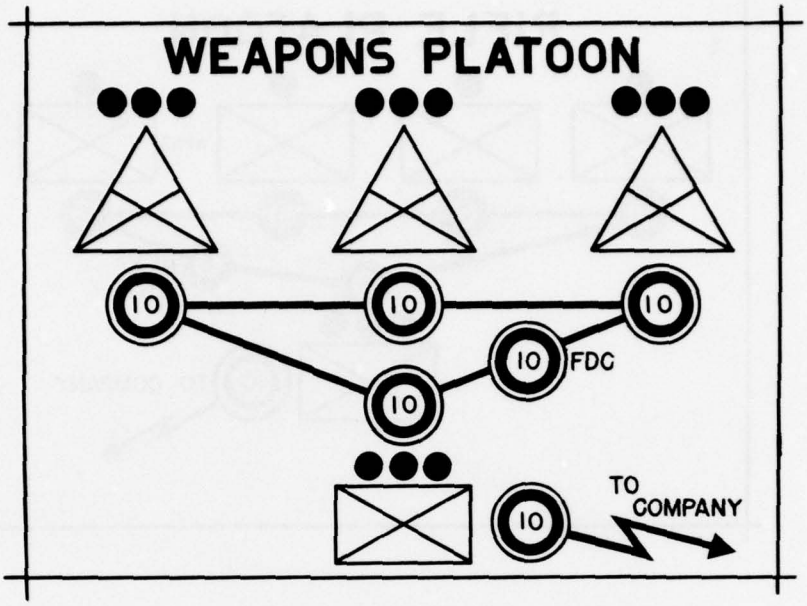


Figure 4. Weapons Platoon Radio Net.

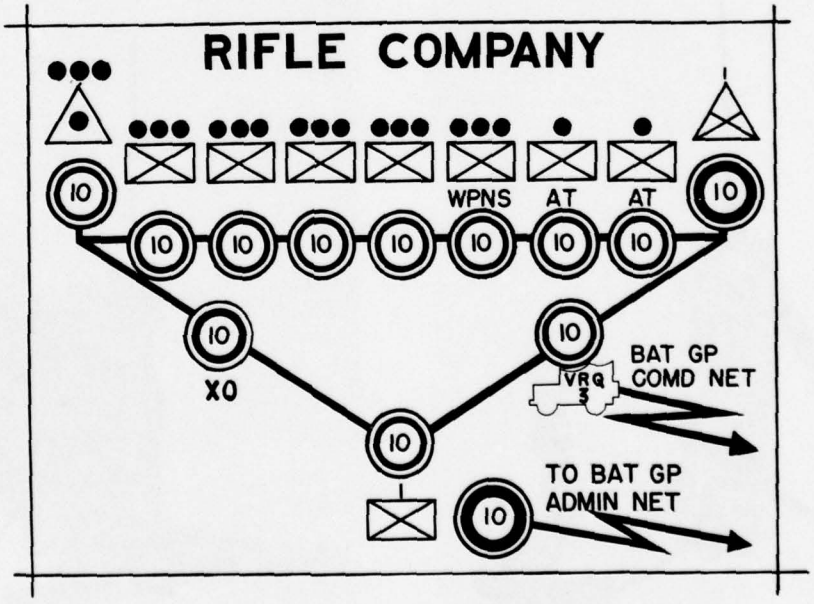


Figure 5. Rifle Company Command Net.

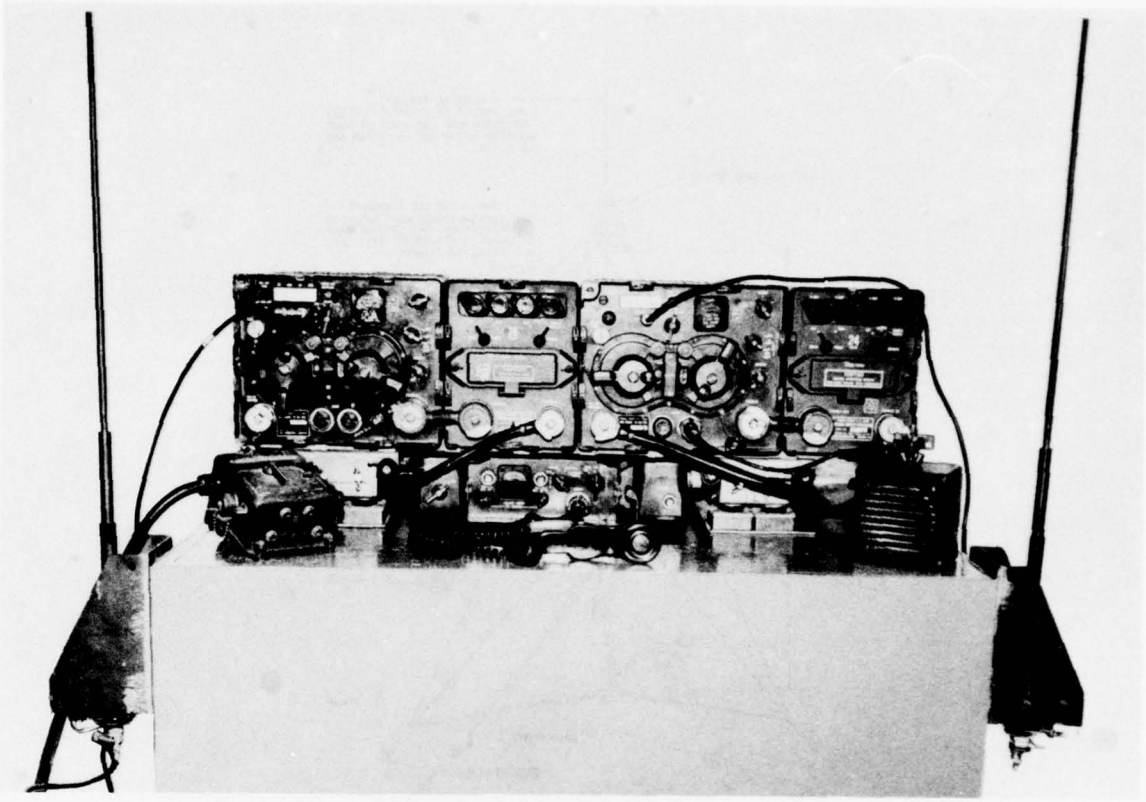


Figure 6. AN/VRQ-3 Radio Set (Figure 47, Comm Data).

may enter the company command net, thereby maintaining continuous contact with all elements of the company. The rifle company executive officer is also provided an AN/PRC-10 radio to operate in the company command net.

The company commander has a requirement to operate in two nets simultaneously, the company command net and the battle group command net. The vehicular mounted radio set AN/VRQ-3 (Figure 6), two transceivers (one transceiver consists of a transmitter and receiver combined in one package), is provided the company commander to operate in both radio nets without frequent changing of channels. One transceiver will be operated in the battle group command net and the other, on low power, in the company command net.

A requirement exists for the rifle company to operate in the battle group administrative net to receive and pass administrative and logistic type traffic (Figure 5). An AN/PRC-10 radio set is provided on the draft "D" series TOE for this purpose. Each company has been provided two antennae, RC-292 (Figure 7), more commonly known as jungle antennae, which will provide for extending the range of the AN/PRC-10, when in a stationary position, to approximately 16 kilometers. This is equivalent to the range of the vehicular radios used in the battle group command net. The jungle antenna may also be used to extend the range of the vehicular radio in the company when in a stationary position.

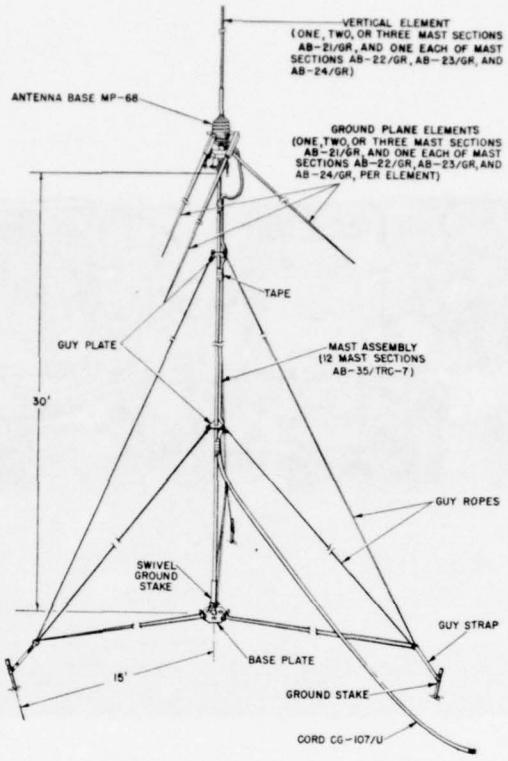


Figure 7. Antenna RC-292 (Figure 54, Comm Data).

We find, for the first time, that the radio equipment which has been provided to the rifle company commander will not only allow him to extend the ranges of his radio sets, but will provide greater capability and flexibility as well. One of these items is the modification kit MX-898 (Figure 8), which will allow one of the transceivers of the AN/VRQ-3 to be ground mounted. The retransmission capability, which is inherent in the vehicular mounted AN/VRQ-3, is another that can assist greatly in extending the ranges of our radio equipment when necessary. Another of these items, the cable kit MK-126 (Figure 9), a special cable, provides another retransmission capability when used with two AN/PRC-10's. To gain added range, the antenna RC-292, previously mentioned, may be used at the retransmission site.

We will leave radio nets and equipment just for a moment and discuss a change in the rifle company wire system (Figure 10). A 12-drop switchboard, SB-22, with both audible and visual alarm, has been provided for use at the company command post. The light emergency switchboard SB-18 (to be replaced by a similar switchboard) is available for use at the 81mm mortar fire direction center. Wire equipment is available with which to provide a wire system paralleling the company radio net.

One item worthy of note before we leave the rifle company is the fact that messengers, as such, will not be found in the rifle company draft "D" series TOE.

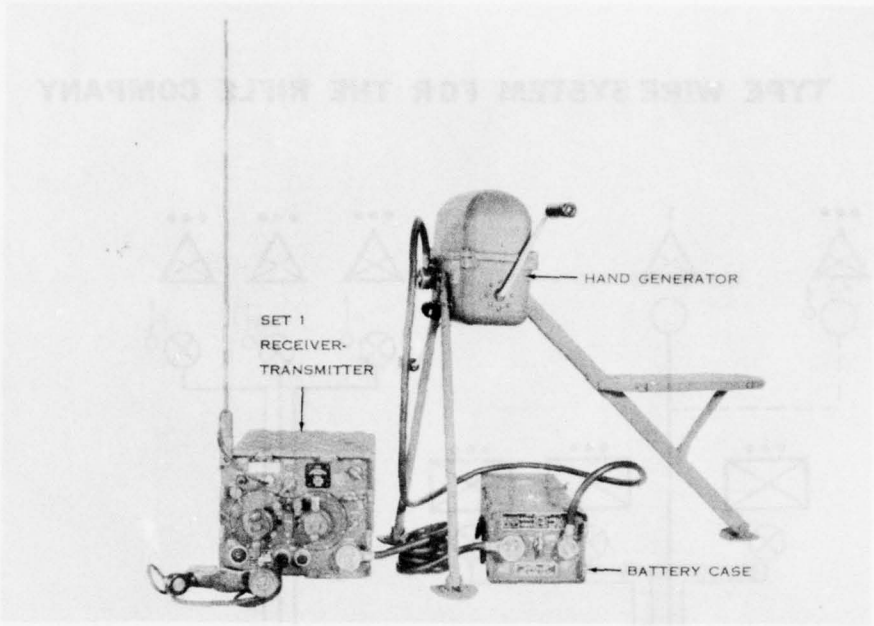


Figure 8. Modification Kit MX-898 (Figure 52, Comm Data).

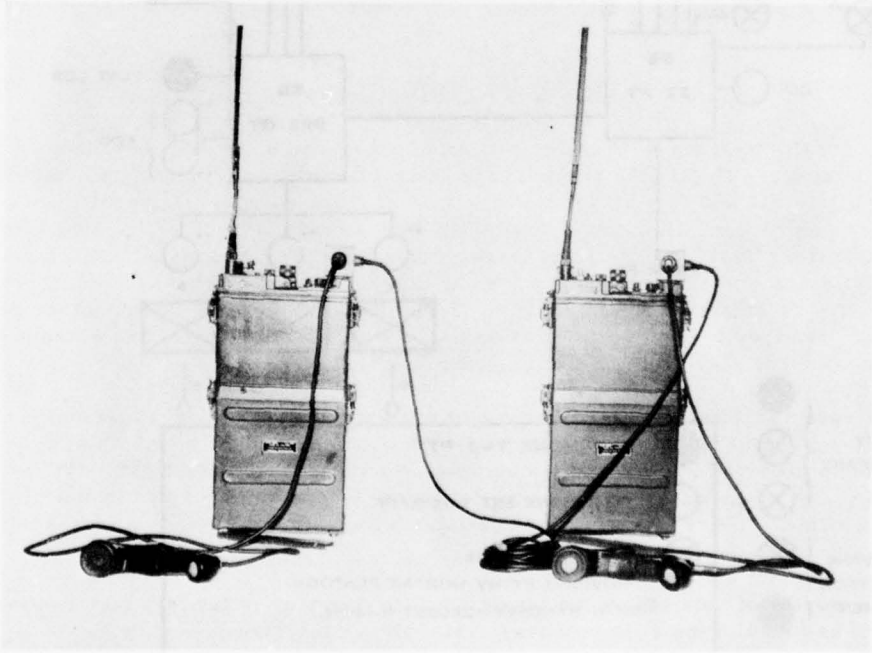


Figure 9. Retransmission Cable Kit MK-126 (Figure 11, Comm Data).

TYPE WIRE SYSTEM FOR THE RIFLE COMPANY

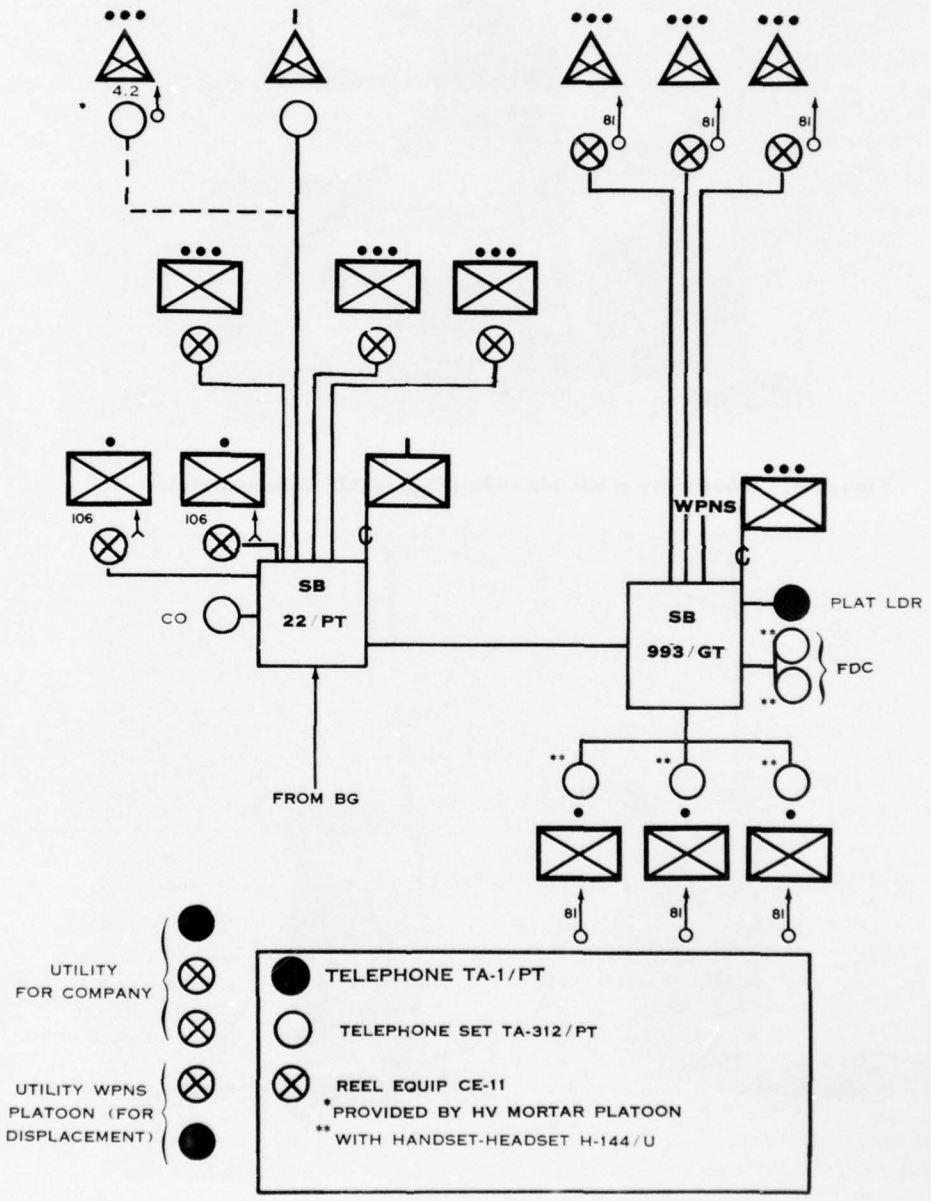
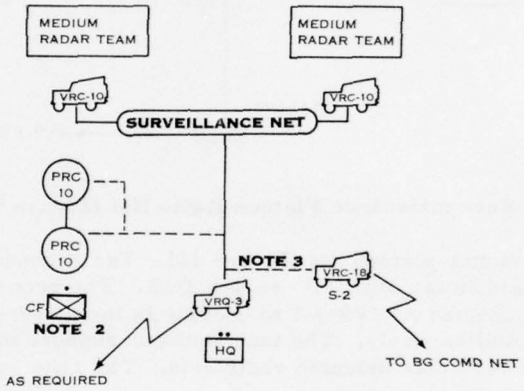


Figure 10. Rifle Company Wire System (Figure 94, Comm Data).

A new unit which we will find, the combat support company, does not have a company command net. This is true because the operations of subordinate elements of the company are not controlled by the company, but are controlled by battle group. They are employed to support the battle group and, therefore, operate in the battle group command net. The combat support company commander and the executive officer are, however, each provided with the vehicular mounted AN/VRQ-3 radio set to enable them to enter nets as required in the performance of missions assigned the company. These missions as outlined in FM 7-40 are: to act as the alternate battle group command post; to perform in a rear area security role; or provide the nucleus of a headquarters for the deputy battle group commander when the battle group is operating on two axes. These missions, as well as the desires of the battle group commander, will dictate the employment of the combat support company commander's radio equipment. The combat support company executive officer employs his radio set in the battle group administrative net, since the company is responsible for the administration of its subordinate units although not their operations. I would like now to discuss the communications available to the subordinate elements of the company. First, the radar section net.

Type Radio Net, Radar Section, Infantry Battle Group



NOTE: 1. LIGHT RADAR TEAMS MAY ENTER THIS NET AS REQUIRED. WHEN ATTACHED TO RIFLE COMPANIES THE LIGHT RADAR TEAMS WILL ENTER THE COMPANY COMMAND NET.
2. ENTERS SURVEILLANCE NET WHEN TRANSMITTING INFORMATION TO S-2.
3. MONITORS NET

Figure 11. Radar Section Radio Net (Figure 106, Comm Data).

The radar section leader is provided the vehicular radio set AN/VRQ-3 to operate in a battle group net as required and to maintain contact with the medium-range radar teams in the surveillance net (Figure 11). Each of the medium-range radar teams is provided the vehicular mounted radio set AN/VRC-10 (one transceiver) for operation in the surveillance net. Each of the five short-range radar teams is provided with the radio set AN/PRC-10. These teams are not shown here since they are normally attached to rifle companies and will, therefore, enter the rifle company command net of the company to which attached. The battle group S2 has the facility to monitor the surveillance net by using the auxiliary receiver of his AN/VRC-18 radio set. If a situation should arise whereby the counterfire squad might be required to operate in the surveillance net, the radio set AN/PRC-10 is provided for that purpose.

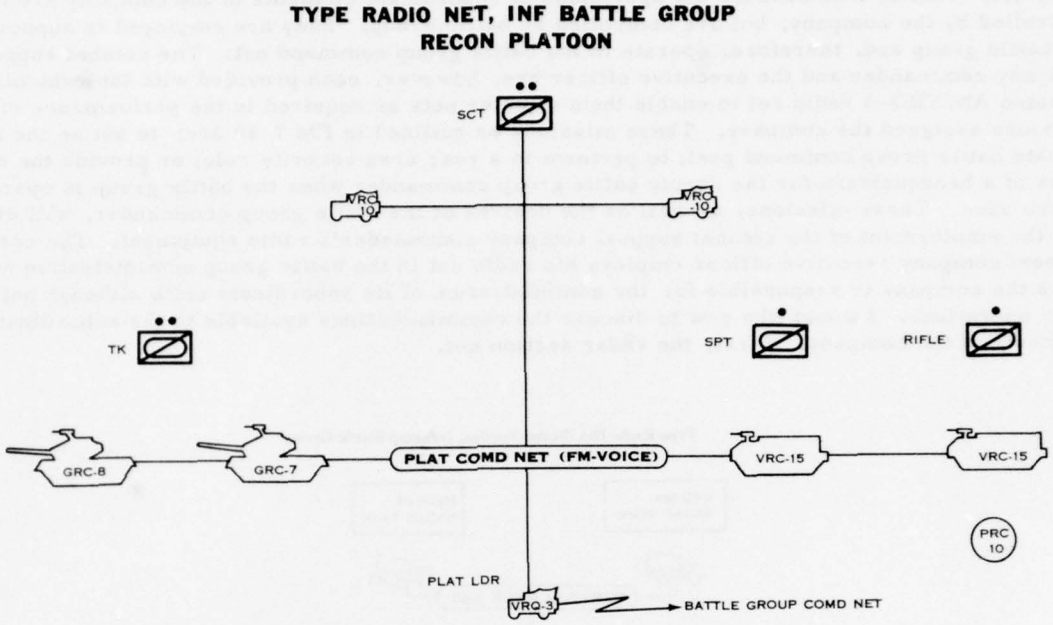


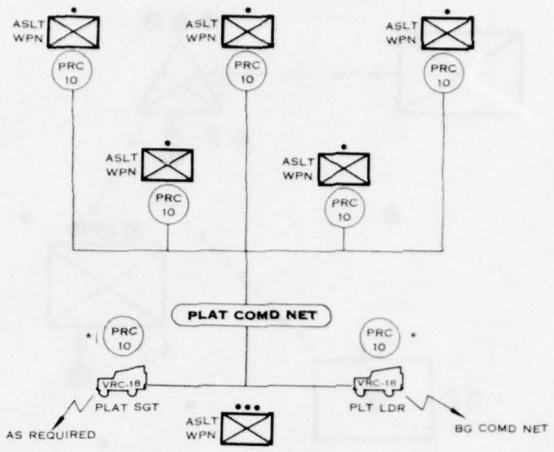
Figure 12. Reconnaissance Platoon Radio Net (Figure 99, Comm Data).

Next, the reconnaissance platoon net (Figure 12). The reconnaissance platoon radio equipment has not been changed in the draft "D" series TOE. The reconnaissance platoon leader is provided the vehicular mounted AN/VRQ-3 to operate in the battle group command net and the platoon command net simultaneously. The tank section, support squad, rifle squad and scout squads are all provided vehicular mounted radio sets. The rifle squad is also provided a radio set AN/PRC-10 for dismounted operations.

Now let us consider the assault weapons platoon net (Figure 13). The assault weapon platoon leader and the platoon sergeant are provided vehicular radio sets AN/VRC-18, one transceiver and an auxiliary receiver. The platoon leader operates in the battle group command net and the platoon command net while the platoon sergeant will operate in the platoon command net and as required by the platoon leader. The platoon leader and platoon sergeant are also provided portable radio sets for dismounted operation. Each of the five assault weapon squads is provided the radio set AN/PRC-10 with which to operate in the platoon radio net.

The radio capabilities of the heavy mortar platoon are similar to those that were available to the heavy mortar battery of the ROCID battle group (Figure 14). Radio equipment is provided to establish a fire direction net and a fire control net. Each forward observer has a vehicular mounted radio set AN/VRC-10 for operation in the fire direction net and two portable radio sets, one for dismounted operation in the fire direction net and one for operation in the supported rifle company command net. Two 3/4-ton trucks in the fire direction center mount identical radio equipment to provide facilities for directing fires from a platoon position, two section positions or for displacement purposes. Each truck mounts one AN/VRC-10, an Infantry type set for operation in the fire direction or fire control net; an AN/VRC-9, an artillery type vehicular radio set, to provide communication with the direct support artillery battalion fire direction center; and

Type Radio Net, Assault Weapon Platoon, Infantry Battle Group



NOTE: EACH SQUAD HAS ONE TA-1/PT USED IN THE PLATOON WIRE SYSTEM WITH THE PLATOON HEADQUARTERS WHICH HAS A TA-312. THIS WIRE SYSTEM PARALLELS THE RADIO NET. WHEN ATTACHED TO RIFLE COMPANIES THE SQUADS WILL BE INTEGRATED INTO THE COMPANY COMMUNICATION SYSTEM.
* DISMOUNTED USE.

Figure 13. Assault Weapon Platoon Radio Net (Figure 102, Comm Data).

TYPE RADIO NETS INFANTRY HEAVY MORTAR PLATOON
INFANTRY DIVISION BATTLE GROUP
(PLATOON POSITION)

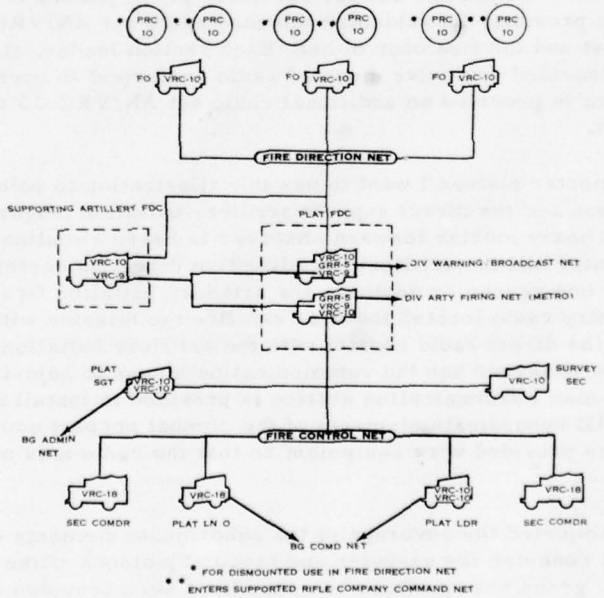


Figure 14. Heavy Mortar Platoon Radio Net (Figure 103, Comm Data).

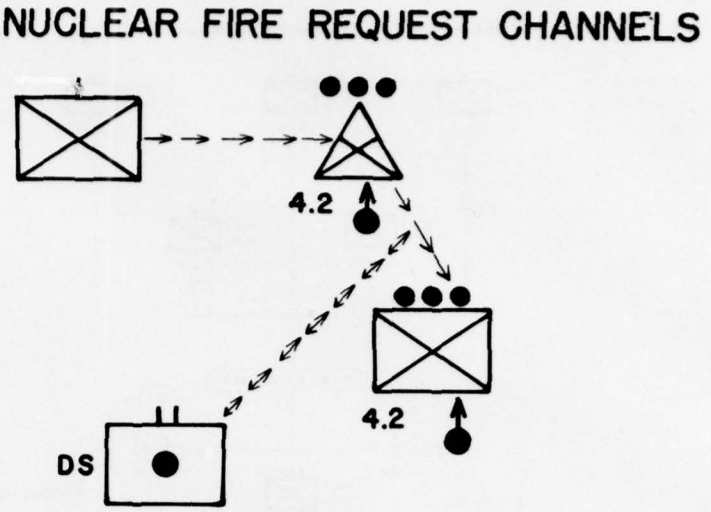


Figure 15. Fire Request Channels.

one radio receiver AN/GRR-5 to operate in the division warning broadcast net and the division artillery firing net (the metro net). The supporting artillery fire direction center, indicated by this vehicle, is provided an Infantry type vehicular radio set to allow calls for fire from the mortar platoon forward observer to be heard in the artillery fire direction center, just as the provision of artillery type radio sets at the mortar platoon fire direction center allow calls for fire from the artillery forward observer to be monitored at the mortar platoon fire direction center.

The platoon leader is provided two vehicular mounted radio sets AN/VRC-10, one to operate in the battle group command net and one for operation in the platoon fire control net. The platoon liaison officer is provided the vehicular mounted radio set AN/VRC-18 to operate in the battle group command net and the fire control net. Each section leader, the platoon sergeant and the survey section are provided vehicular mounted radio equipment to operate in the fire control net. The platoon sergeant is provided an additional radio set AN/VRC-10 to operate in the battle group administrative net.

Before leaving the mortar platoon I want to use this illustration to point out the radio link between the mortar platoon and the direct support artillery battalion (Figure 15). A request for fire originating with this heavy mortar forward observer is heard simultaneously by the heavy mortar fire direction center and the artillery battalion fire direction center. If the mortars cannot fire the mission, for one reason or another, the artillery battalion fire direction center, by reason of having an Infantry radio located therein, can fire the mission with a negligible loss of time. Also, because of the direct radio contact with the artillery battalion fire direction center, the heavy mortar forward observer has the communication means to adjust the artillery fire. So much for radio. A nine-man communication section is provided to install a wire system for the heavy mortar platoon. All subordinate elements of the combat support company, except the reconnaissance platoon, are provided wire equipment so that the radio nets may be paralleled by wire systems.

Now that we have completed the coverage of the subordinate elements of the combat support company, I would like to consider the engineer and medical platoons of the battle group. These two platoons of the battle group headquarters company have been provided internal radio communication for the first time. The engineer platoon is provided four AN/PRC-10 radios, one

used at platoon headquarters and one for each squad with which to establish a platoon command net. The platoon leader is also provided a vehicular mounted AN/VRC-18 to operate in the battle group administrative net. The medical platoon has been provided four AN/PRC-10 radio sets, two for the treatment section and two for the evacuation section.

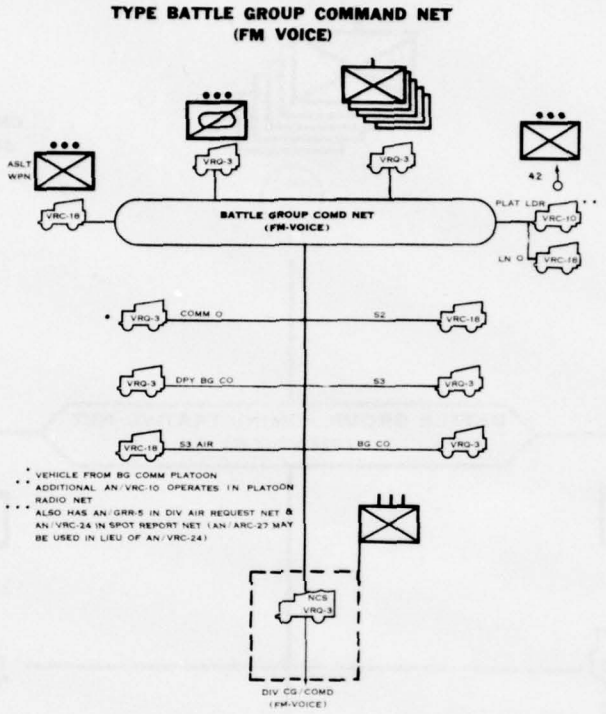
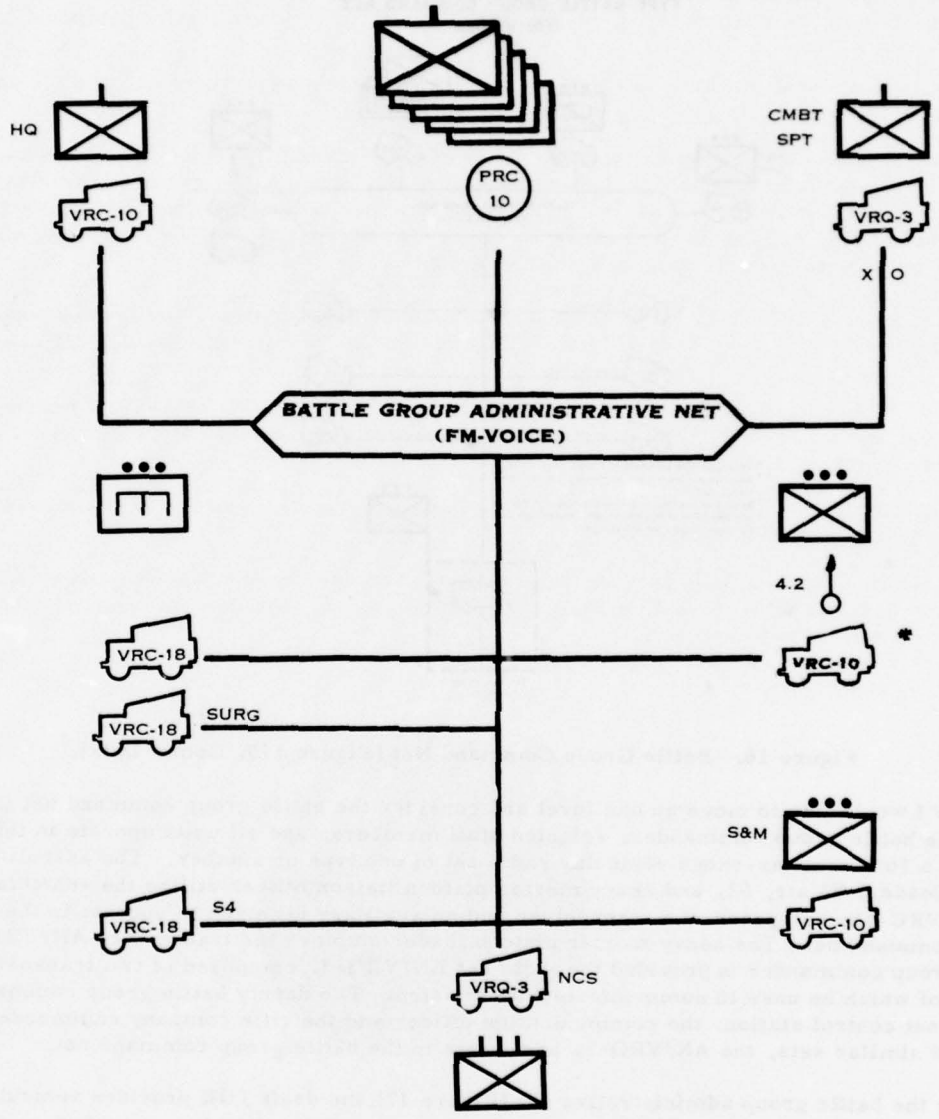


Figure 16. Battle Group Command Net (Figure 110, Comm Data).

Now I would like to move up one level and consider the battle group command net (Figure 16). The battle group commander, selected staff members, and all units operate in this radio net with a 16-kilometer-range vehicular radio set of one type or another. The assault weapon platoon leader, S3 air, S2, and heavy mortar platoon liaison officer utilize the vehicular radio set AN/VRC-18, composed of a transceiver and an auxiliary receiver to operate in the battle group command net. The heavy mortar platoon leader employs the transceiver AN/VRC-10. The battle group commander is provided the radio set AN/VRQ-3, composed of two transceivers, a portion of which he uses to communicate with division. The deputy battle group commander, the S3, the net control station, the communication officer and the rifle company commanders are provided similar sets, the AN/VRQ-3, to operate in the battle group command net.

For the battle group administrative net (Figure 17), the draft TOE provides vehicular mounted radio sets for the engineer platoon leader, the headquarters company commander, the battle group surgeon, the net control station, the platoon sergeant of the heavy mortar platoon, the assistant S4, the S4 and the combat support company executive officer. The rifle companies still operate in this net with the AN/PRC-10 radio set. The battle group wire system, of course, parallels the battle group radio nets to provide more than one means of communication.

TYPE BATTLE GROUP ADMINISTRATIVE NET



*ADDITIONAL AN/VRC-10 OPERATES IN PLAT RAD NET

NOTE: THE ASLT WPN PLATOON MAY ENTER THE BG ADMIN NET AS REQUIRED.

Figure 17. Battle Group Administrative Net (Figure 111, Comm Data).

The changes which take place within the communication platoon of headquarters and headquarters company are few, the most significant being the addition of a commissioned officer as a platoon leader. Other major changes in the TOE of the platoon are the addition of one radio operator and one 1/4-ton truck with radio set AN/VRQ-3 to the radio and visual section; an additional 1/4-ton truck to the wire section; and a 3/4-ton truck to the message center section. This concludes coverage of the highlights of items provided by the draft "D" series TOE.

Subsequent to the receipt of the draft TOEs, several actions have been taken which hold promise that other items may be included in the TOEs when they are finally published. These are:

a. Five sound-powered telephones, one for platoon headquarters and one for each squad, with which to provide a platoon wire system.

b. A vehicular mounted radio, the AN/VRQ-3 (Figure 5), for the rifle company executive officer to enable him to communicate simultaneously in the battle group administrative net and the company command net, as well as to provide a means through which he can rapidly regain control of the company in the event the company commander becomes a casualty and his vehicular radio equipment is damaged or destroyed.

c. Four AN/PRC-10 radio sets, one for platoon headquarters; one for the support squad, and two for the scout section, as additions to the reconnaissance platoon for dismounted use.

d. AN/VRC-10 radio sets for the assault weapons squads of the assault weapons platoon (Figure 13), and an AN/VRQ-3 for the platoon leader and one for the platoon sergeant, to increase the operational capability of the platoon.

e. An AN/VRQ-3 for the battle group executive officer to provide him a means of entering the battle group command net.

Certain recommendations relating to personnel increases have not been incorporated in the draft TOEs because of personnel ceilings. These ceilings do not allow for the inclusions of all desirable personnel requirements.

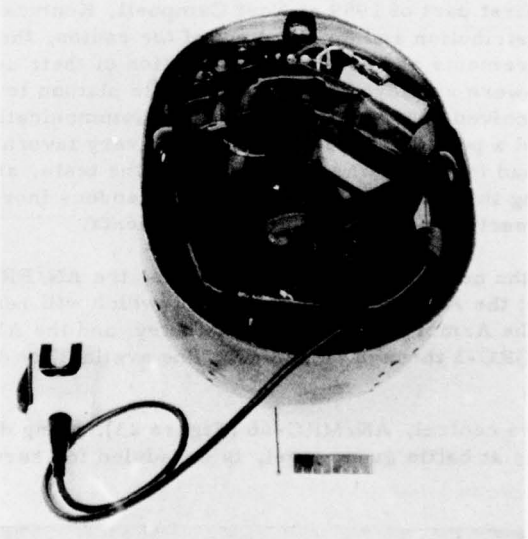


Figure 18. AN/PRC-34 Radio Set.

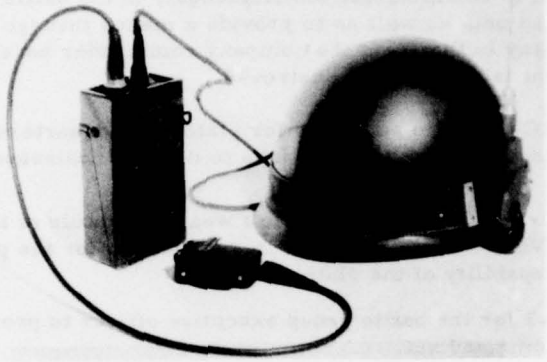


Figure 19. AN/PRC-36 Radio Set.

I would like now to bring you up-to-date on the status of new equipment. The individual radios, AN/PRC-34 (Figure 18), contained in the helmet, and the AN/PRC-36 belt model (Figure 19) were tested during the first part of 1959 at Fort Campbell, Kentucky. The purpose of the test was to ascertain the distribution and employment of the radios, their effect on command and fire control, training requirements and an overall evaluation of their usefulness tactically. During the test, the radios were employed primarily at rifle platoon level. The final report of the test has not yet been received, but an officer from the Communication Department of the Infantry School, who observed a portion of the test, reported very favorable and enthusiastic comments from platoon and squad leaders, who participated in the tests, as to the capabilities of the equipment. Personnel using the equipment reported a tremendous increase in command and fire control and a speed-up in reaction time of subordinate elements.

You are familiar with the new family of FM radio sets, the AN/PRC-35 (Figure 20), which will replace the AN/PRC-6; the AN/PRC-25 (Figure 21), which will replace the AN/PRC-8, -9 and -10 currently used by the Armor, Artillery and Infantry; and the AN/VRC-12 (Figure 22), which will replace the AN/GRC-3 through -8 series. The availability date of this equipment is 1961.

The last item, the radio central, AN/MRC-66 (Figure 23), being developed to supplement radio nets and wire systems at battle group level, is scheduled for service testing in 1960.

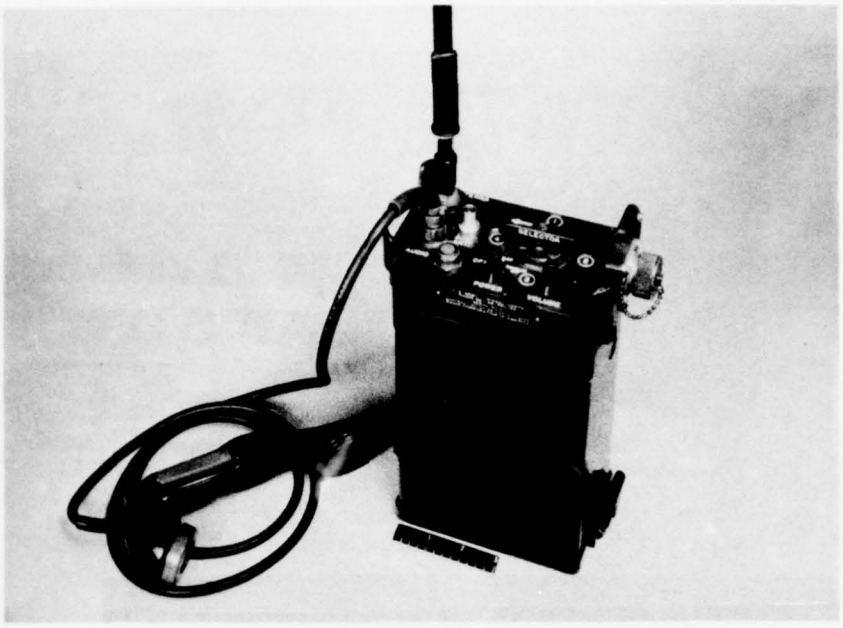


Figure 20. AN/PRC-35 Radio Set.

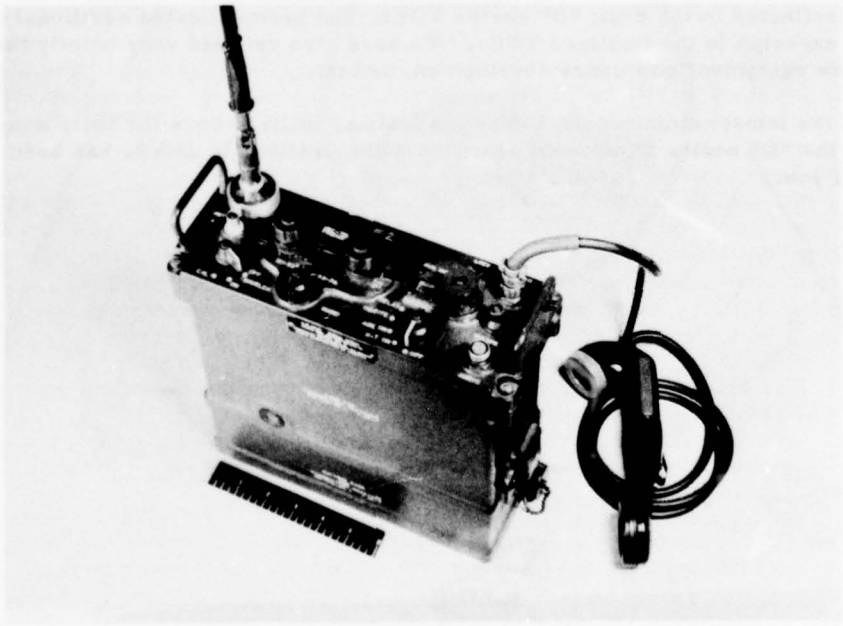


Figure 21. AN/PRC-25 Radio Set.

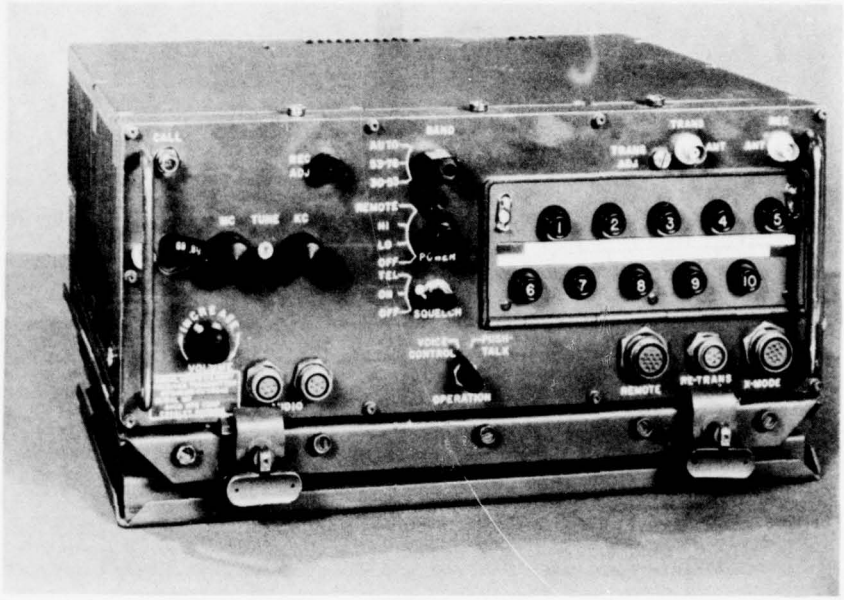


Figure 22. AN/VRC-12 Radio Set.

Gentlemen, we have covered the changes in the battle group communication system which are presently reflected in the draft "D" series TOEs, and have indicated additional changes which may be expected in the finalized TOEs. We have also covered very briefly the status of some of the new equipment now under development or test.

A copy of the latest communication data publication, utilized here for instructional purposes, incorporating the "D" series TOE communication authorizations in detail, has been made available to each of you.

AN/MRC-66....

Communication Central

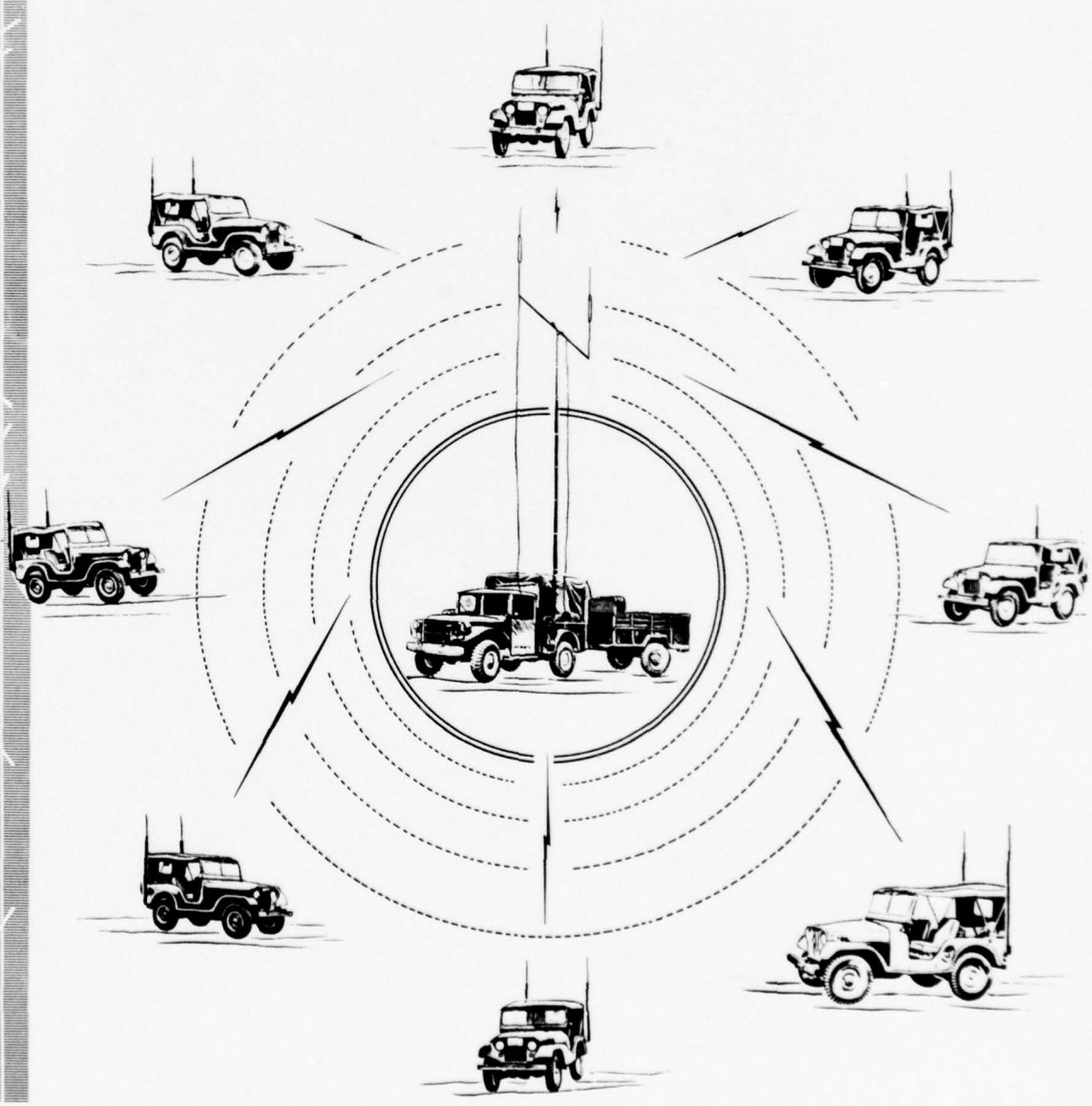


Figure 23. AN/MRC-66 Central Station.

CHAPTER 6
GROUND MOBILITY DEPARTMENT PRESENTATION

Section I. ORGANIZATION FOR MAINTENANCE

CAPTAIN ERNEST F. CONDINA

Instructor, Operations and Control Committee, Ground Mobility Department

The commander of World War I had an entirely different type vehicle than the commander of today. It had one light, an open cab, no front-wheel drive, solid rubber tires and a solid front axle. This vehicle was not designed for the comfort of the driver, and its overall efficiency could be questioned. Since World War I we have improved our transportation to the point of having vehicles that not only are efficient, but also are designed for the overall comfort of the driver and passengers. Although our means of transportation have improved during the passage of time, there is one major problem that confronts the present-day commander much more than it did his World War I counterpart--the problem of maintenance.

The battle group has, due to recent changes in the TOE, more vehicles today than ever before. An example is the additional 1/4-ton front line ambulances now present in the evacuation section of the medical platoon. At present there are 167 wheel vehicles, 127 trailers and four track vehicles in the battle group.

Regardless of your position in an organization, maintenance of vehicles is of primary concern. When a vehicle is not maintained properly, it will not function, therefore denying the commander the use of a piece of equipment necessary to the accomplishment of his mission.

Preventive maintenance by its very nature imposes certain psychological problems that are difficult to combat. These are: The "thine, not mine" complex. This is the feeling that equipment belongs to the user only in the abstract sense that he is one of millions of citizens and taxpayers. It is not the personal possession of the operator, and it is difficult to instill in him the same sense of pride and responsibility that a man feels for his own personal property.

The boredom problem. A man derives a sense of achievement in making a broken piece of machinery operate. He derives no comparable satisfaction from prevention of the malady in the first place. Why? Because he sees no concrete results of his work. It requires continuous routine activity that can, and often does, become sheer drudgery.

The peacetime doldrums. The boredom problem is enlarged by the routine activity of peacetime training--the lack of battle realism to drive the lesson home. Subordinates find it difficult to project their thinking to the battle of the unforeseeable future, when preventive maintenance may mean the difference between life and death, victory and defeat.

The hot-rod complex. We can attribute a lot of our troubles to the drive of young and old to attain a sense of personal power by pushing equipment to the limit of its endurance.

Passing the buck. An all-too-common attitude is "They have the shop, the tools, and the mechanics. We break it, they fix it."

Lack of identification. The inability to identify ourselves with our equipment also works against us. Unlike the horse of yore, our trucks and tanks are cold steel, not living creatures for which we develop personal affection. The result? We abuse the truck since it feels no pain.

Maintenance camouflage. This is a condition so common that it hardly warrants explanation, yet it persists to the detriment of preventive maintenance. How many times has a commander left a motor pool of clean, neatly alined vehicles, a maintenance shop camouflaged with clean tools, records, and supply manuals, without knowing that 50 percent of his equipment will not operate? These are some of the mental obstacles in the commander's way. Only the imaginative, knowledgeable, and aggressive commander will overcome them.

In assigning maintenance responsibilities to a unit, there are certain facts that must be considered. First, the mission of the unit. The rifle company cannot accomplish the mission of closing with and destroying the enemy by fire and maneuver if it is required to perform extensive maintenance. Second, the character and mobility of the unit must be considered. If we make a comparison of the rifle company with the Armored Infantry company, it is readily apparent that the two would not have the same maintenance responsibilities due to the difference in degree of mobility. Third, the economical distribution of skilled personnel, tools, parts and funds must be accomplished. It would not be economical to place trained mechanics in all company-size units throughout the Army, nor to equip these units with extensive tool sets and spare parts.

With these considerations in mind, the Army system of maintenance was divided into three major categories: organizational maintenance, which is work authorized for, performed by, and the responsibility of the using unit; field maintenance, which is work performed by mobile or semimobile technical service units in direct support of the using unit; and depot maintenance, which is work performed by permanent-type installations using extensive equipment.

In order to provide greater flexibility to this system and greater accuracy in assigning maintenance responsibilities, these three categories are sub-divided into five echelons. First and second echelon fall under the category of organizational maintenance in that they are the responsibility of the using unit commander and are performed by the driver, crew and unit mechanics. Third and fourth echelon fall under the category of field maintenance, being the responsibility of the division and Army commanders and performed by mobile division and Army Ordnance units. Fifth echelon falls under the category of depot maintenance and is the responsibility of the chiefs of the technical services or the theater commander. It is performed by permanent-type depot ordnance installations.

Of these three categories and five echelons, we are primarily concerned with organizational maintenance. Normally, we at the battle group level will not be directly concerned with the control or operation of field and depot maintenance other than receiving adequate support from these organizations. Organizational maintenance, as stated earlier, is performed by the driver, crew and organizational mechanics. This maintenance is termed preventive maintenance and is the heart and soul of the Army system of maintenance, and consists of the following functions:

1. Inspecting
2. Servicing
3. Cleaning
4. Tightening
5. Adjusting

6. Minor Repair

7. Minor Replacement of Parts

The driver and/or crew is responsible for the first four of these functions. The unit mechanics handle the last three along with inspecting the vehicle when the opportunity presents itself. The overall success of this system, of course, depends on the caliber of personnel that commanders assign to the motor pool and the supervision given these individuals.

In August 1958 the Army adopted a new preventive maintenance system, which is outlined in TM 9-2810. This system eliminates the old lettered system that you are probably familiar with. As a matter of comparison we will discuss both the old and new systems so that you may see the progress made in the field of preventive maintenance.

The old system consisted of four lettered services commonly known as A, B, C, and D services. The A service was performed by the driver and crew on both wheel and track vehicles each day the vehicle was operated. The B service was performed by the driver and crew every week on track vehicles and by the driver and crew every two weeks on wheel vehicles. The C service was performed by the organization mechanics every month or 250 miles on track vehicles and every 1000 miles on wheel vehicles. The D service was performed by the organization mechanics every three months or 750 miles on track vehicles and every six months or 6000 miles on wheel vehicles.

The new system consists of only three services, two of which are performed by the driver and crew. The first service is the driver-crew service, which is performed by the driver and crew on both track and wheel vehicles each day the vehicle is operated. The second service is the quarterly or "Q" service, which is performed by the organization mechanics assisted by the driver every three months or 750 miles for track vehicles and every three months or 3000 miles for wheel vehicles. The third and final service is the lubrication service, which is performed in accordance with the lubrication order issued with each vehicle, and is performed by the driver and/or crew. The major benefit of the new system over the old is that it requires less periods of scheduled maintenance, therefore enabling the leaders to have the use of their vehicles more often than in the past.

Regardless of the system that is used within the Army for getting maintenance performed, the success of it will depend on the supervision given it. At present there are many commanders that are reluctant about making inspections of their organic vehicles because they are not skilled mechanics. You don't have to be a skilled mechanic to perform inspections on vehicles. If the commander will use the preventive maintenance indicators, he can determine if the vehicles of his unit are being maintained properly.

There are nine preventive maintenance indicators that should be used by commanders in making inspections of vehicles. They are:

1. Performance. Does the vehicle run and perform in a satisfactory manner?

2. Leaks. Are any of the water, gasoline or oil connections leaking?

3. Noises. All vehicles make noise of some description; listen for noises strange to the vehicle.

4. Lubrication. Look at grease fittings and check oil level.

5. Loose or missing parts. Are any parts loose or missing on the vehicle?

6. Cracked or broken parts or assemblies. Are any parts cracked or broken on the vehicle?

7. Adjustment. Brakes, clutches, steering wheels and other working parts often are out of adjustment. Simply by movement we can tell if adjustment is necessary.

8. Cleanliness. Is the vehicle free from mud and dirt both on the outside and the inside?

9. Damage and abuse. Is the driver taking care of this vehicle?

There are three reasons for the use of indicators by the commander:

1. The commander should inspect. There is a common tendency in the current Army to consider the physical inspection of equipment as a function reserved to the specialist, and beyond the capability or proper activity of the commander himself. This is a dangerous and false philosophy. The most critical single element of effective unit maintenance is personal inspection by the commander. This includes the commander at all levels.

2. The commander is not a specialist. For practical reasons, the commander's inspection must be limited in scope. Considering the relative complexity of modern equipment and the extensive knowledge of other matters which the commander must have, it would be impractical to expect him to know highly technical details or to inspect for them. Indicators provide him with a method of compromise in this problem.

3. The time element. Even if the commander were a technician, he would not normally have nearly the time required for a thorough inspection of equipment. Again, the use of indicators provides him with a solution through the use of simple, readily accessible inspection points.

Finding the deficiencies of a vehicle is only half the job. We must insure ourselves that these deficiencies are corrected either by the driver and crew, or the organization mechanics. At the present time we have a total of 24 maintenance personnel authorized in the battle group. They are as follows:

<u>In Headquarters and Headquarters Company</u>

One Captain Motor Officer (special staff officer)
One Warrant Officer maintenance officer
One E-7 motor sergeant
Two E-5 senior wheel vehicle mechanics
One E-4 ordnance parts specialist
One E-4 track vehicle mechanic
Five E-4 wheel vehicle mechanics
One E-4 wrecker operator
Four E-3 wheel vehicle mechanic helpers

<u>In Combat Support Company</u>

One E-5 motor sergeant
One E-5 senior wheel vehicle mechanic
One E-4 track vehicle mechanic
One E-4 wheel vehicle mechanic
One E-4 wrecker operator
Two E-3 wheel vehicle mechanic helpers

The rifle companies of the Infantry division battle group have first echelon capabilities only. The combat support company has first echelon capability and limited second echelon capability. Headquarters and headquarters company has first echelon capability and second echelon capability in addition to providing second echelon for each of the rifle companies and second echelon support to combat support company.

Preventive maintenance is the heart and soul of the entire maintenance system. A superficial look at the vast complex that makes up that system might give the impression that maintenance by the user is unnecessary, that the equipment can be driven until it fails and then unloaded on the broad shoulders of higher echelons. This is in complete contradiction to the fact that the entire system assumes that the using unit will care for the equipment to avoid such failure. The system will bog down completely (and indeed it has bogged down on many occasions), if equipment is not properly operated, cleaned, lubricated, tightened and adjusted on a systematic basis by the user. Even minor repairs and parts replacements authorized for second echelon maintenance of equipment are preventive in that they are designed to forestall the more complex and time-consuming repairs that will otherwise result.

If we are to have harmony and balance in the maintenance system, it is important that the responsibilities of each maintenance echelon be kept in proper perspective. The Infantry commander is not expected to perform field and depot maintenance, and the higher echelons are not expected to perform the organizational maintenance.

Section II. PRODUCTION OF MOBILITY

CAPTAIN ERNEST F. CONDINA

Instructor, Operations and Control Committee, Ground Mobility Department

See Infantry Instructors' Conference Report (Classified Annex)

CHAPTER 7
AIRBORNE--AIR MOBILITY DEPARTMENT PRESENTATION

Section I. INTRODUCTION

LIEUTENANT COLONEL HAROLD E. GREER
Director, Airborne - Air Mobility Department

I would like to take this opportunity to introduce you to the two presentations given by the Airborne-Air Mobility Department. My remarks will be brief in nature, inasmuch as I believe that the block of instruction which follows will indicate, in detail, current thinking within the department and the School with regard to airmobile activities.

I feel I would be remiss, however, if I did not give you our overall ideas, objectives, and desires concerning airmobile operations on the battlefield of the future. We believe that this future battlefield, nuclear and nonnuclear, will require that commanders make the most efficient use of all available means to successfully defeat a powerful and determined enemy. Not the least of the means which will be available to commanders in the future is a greatly increased capability for mobility; mobility through the air. The air mobility about which we are speaking is that mobility provided by organic and attached Army aviation. The operations in which they engage are commonly called airmobile operations. We believe that there is currently a misunderstanding in the minds of many personnel concerning airmobile and airborne operations. Although similar and very often complementary, these two type operations, airmobile and airborne, are distinctly different in scope, techniques, procedures, and--most of all--experience factors. It is well known that the United States Army obtained invaluable experience in airborne operations during World War II and Korea. Since that time techniques and procedures have been refined through continued training and maneuvers. The primary limiting factors to airborne operations in the future, we believe, will be a lack of sufficient troop carrier type aircraft with which to transport participating forces.

Airmobile operations are quite different in that, although all echelons of command and many individuals and commanders have preached air mobility, most of our so called air mobility has been through the use of words--in other words, you might say "hot air mobility." Actually the capacity for moving tactical units by air in unilateral airmobile operations has existed for some time; however, only recently has sufficient aircraft become available to permit detailed plans to be made and experience to be obtained in airmobile operations.

I will not say more on this particular subject at this time inasmuch as I would undoubtedly detract from the presentations to follow. In the first part of this presentation the Air Mobility Group of the Airborne Department will discuss with you the overall Army Aviation program. Then the Airborne Training Group will present to you detailed requirements concerning the implementation of newly recognized doctrine within the Army in the field of air mobility. These requirements must be fulfilled if the Army is to, in fact, make maximum utilization of a most effective means of improving mobility during combat operations.

Section II. AIR MOBILITY

CAPTAIN R. M. WHITELAW

Instructor, Advanced Airborne Committee, Airborne - Air Mobility Department

In May of this year, Department of the Army published a Training Circular 20-1, titled "Airmobile Operations." This circular was prepared by the Airborne-Air Mobility Department. The Infantry School believes this circular will have far-reaching impact on the training of our Army--for it applies to all branches and all service schools. A copy of the circular will be available to each of you in the rear of the classroom at the completion of this presentation.

It is my purpose this afternoon to discuss with you how our Army can achieve the air mobility which we desire. This presentation will be confined to two principal areas: TC 20-1 "Airmobile Operations" and terminal guidance.

The purpose of Training Circular 20-1 is to prescribe training in the conduct and support of airmobile operations in airborne, armored and Infantry divisions, and armored cavalry regiments; to provide guidance for preparing these units to execute a wide variety of airmobile tasks under every permissible condition; and to prescribe responsibilities for the support of these operations by non-divisional units. The objectives of this training are as shown:

1. Improve the combat effectiveness of Army units by exploiting the capabilities of air vehicles.

2. Gain experience that will provide data that can be used to revise current doctrine, tactics, and techniques.

3. Develop doctrine, tactics and tecnniques for the skillful utilization of new types of air vehicles and equipment.

4. Indoctrinate Army personnel at all echelons in the principle that airmobile operations are a normal part of land combat operations.

In discussing the elements of training that will accomplish these objectives, it is necessary that we keep in mind what our goal is in the field of air mobility. And it is equally important that we agree on many basic principals.

Brigadier General Clifton F. Von Kann, who this month becomes Director of Army Aviation, in the office of Deputy Chief of Staff for Operations explained the role of Air Force Aviation and Army Aviation in a recent speech to the Army Aviation Association. In this speech he stated that the Army should not attempt to duplicate functions and services which the Air Force can adequately perform (Figure 1). He believes, and I quote: "In any future theater of operations there will be a substantial Air Force airlift to haul supplies, personnel and equipment to advanced airfields, possibly as far forward as the corps rear areas. This is the support we can and must expect the Air Force to perform for us. We cannot expect the Air Force to go forward of this point. Therefore Army Aviation finds its most urgent and important application in these forward areas where aircraft must be able to operate without airfields."

The trend of Air Force development has been toward larger aircraft with greater cargo capacity, range, and speed. As bigger aircraft were developed, larger airfields became necessary for them. To acquire flexibility in planning, and to capitalize on the versatility of the aircraft, these airfields were located farther and farther from the combat areas.

Our development in Army aircraft should take the opposite approach. Small vertical takeoff and landing, short takeoff and landing, and zero-ground pressure air vehicles are needed

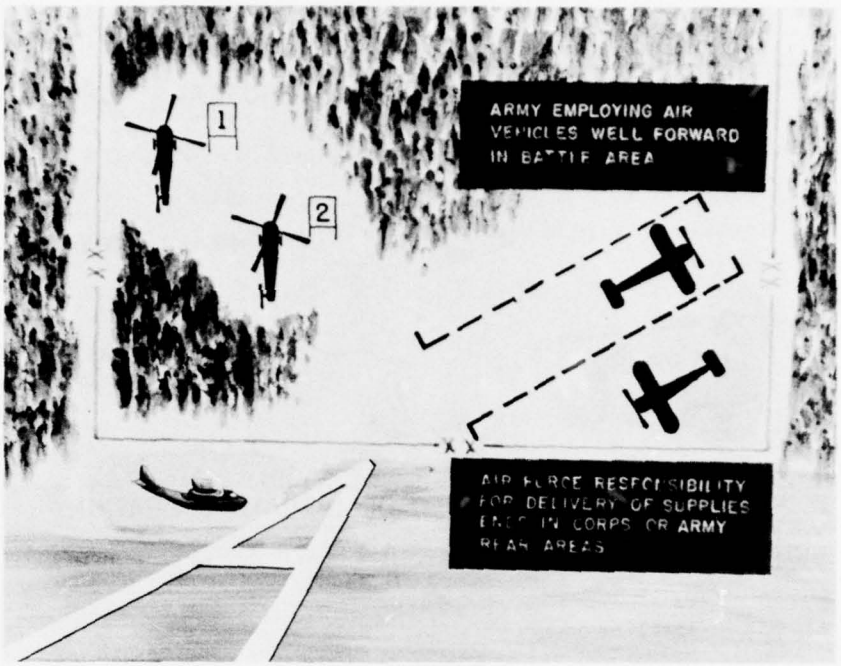


Figure 1.

which can be based with the combat units in the forward areas. Whatever the configuration of these air vehicles, they must be capable of being camouflaged, concealed, and employed within the forward battle areas. In this way maximum flexibility is gained. We can capitalize on the versatility of the aircraft by the speed with which we execute airmobile operations.

This is another important principal--only by speed of execution can we capitalize on the versatility of air vehicles. The concept of preplanned, deliberate-type operations must be replaced. This concept was the outgrowth of World War II. It was based on plans to use Air Force aircraft from large airfields far to the rear of the frontlines (Figure 2).

Today, users of Army aviation still hesitate to employ aircraft without a multitude of plans, coordination, and briefing. Our officers and men should become just as proficient in the employment of air vehicles as they are in the employment of truck transport. And while we employ the helicopter and airplane in our present inventory, we must make provisions for a swift and effective transition to other types of vertical takeoff and landing, short takeoff and landing, and zero-ground pressure vehicles of the future.

Although much has been said in the past few years about air mobility, little training has been accomplished in this field. One of the reasons for this lack of training has been the non-availability of aircraft. Without aircraft individual soldiers and small unit leaders, upon whose shoulders successful operations will rest, cannot be adequately trained. TC 20-1 directs that airmobile training be integrated into current training programs and that organic aircraft will be used to support this training. Aircraft must be available to combat units. Large numbers are not necessary, but some aircraft will have to be frequently provided for this training.

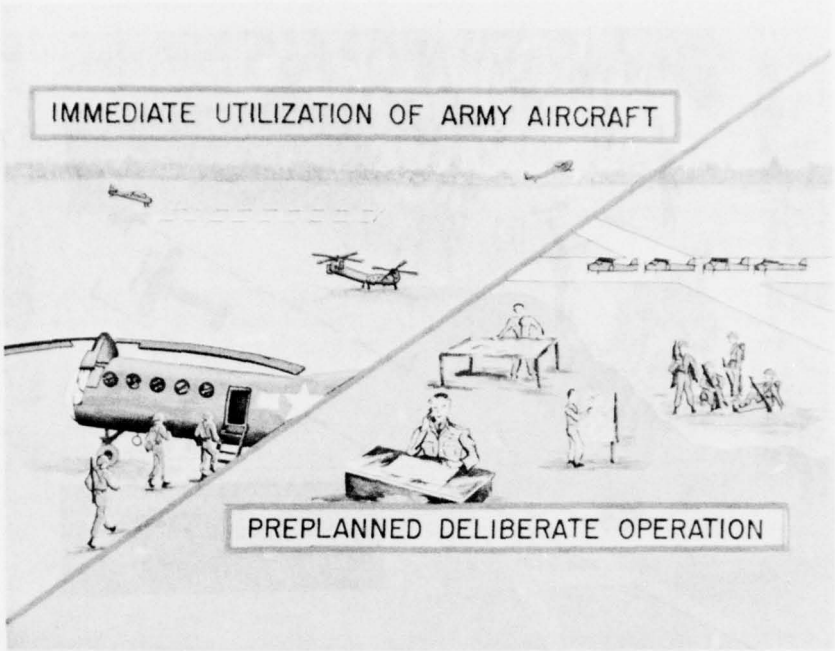


Figure 2.

Figure 3.

With aircraft available, training of the individual soldier and small units can begin. This is the first step as it is with all Army training. Normally our Army training programs are set up to allow each unit to conduct separate training while learning the basic skills applicable to its own organization. This system may not be advisable when applied to airmobile training (Figure 3).

In order that maximum utilization of available aircraft be achieved, both the ground combat units and the aviation units should train together during individual and unit training. Most of the subject matter prescribed for aviation units in TC 20-1 can be conducted in the field in conjunction with ground unit training.

Unit operations officers of both the ground and aviation units must closely coordinate training which requires the use of aircraft. The present problem of not enough aircraft to go around can partially be solved by this method of training. Other benefits derived would be mutual understanding of ground and aviation problems, and the gaining of experience that would provide data to be used in revising current doctrines, tactics, and techniques.

While individual and unit phases of training are conducted, staffs of both ground and aviation elements must be trained in planning and conducting airmobile operations. Let us look at the elements of training prescribed in TC 20-1 for these staffs.

1. Backward planning sequence.

2. Fire support planning.

3. Aerial supply and evacuation procedures.

4. Development of detailed SOPs.

5. Command and staff relationships.

The backward planning sequence method of planning an operation was found to be an excellent approach to planning airborne operations. The many plans, such as the ground tactical plan, the landing plan, the air movement plan, and the marshalling plan, formed a logical sequence--each plan being based upon the preceding one. This backward planning sequence has now been applied to airmobile operations with one change: the marshalling plan is now called the loading plan. And although this sequence is still appropriate, there is inherent danger in too much reliance being placed on a deliberate preplanned operation.

As I have already mentioned, our current concept of air mobility, if it is to be fully exploited, must use Army aircraft in tactical operations with a minimum of time being consumed in planning. No longer will the majority of our airmobile operations be of the preplanned type, as was the case with airborne operations. Fragmentary orders, verbal instructions, and overlay-type orders will be most frequently used.

How then are these immediate-type operations to be conducted without detailed plans being prepared? The first step must be a thorough indoctrination of combat arms officers in the real capabilities and limitations of Army aircraft. This knowledge cannot be gained solely by conferences and demonstrations showing what these aircraft can do under ideal conditions. It will come through day-by-day association with the aircraft under tactical conditions in the field. Even then, safety restrictions placed on pilots during peace time, particularly in periods of bad weather and at night, make training difficult.

The capabilities and limitations of our aircraft are not understood by many commanders. During a recent field exercise, an H19 Chickasaw utility helicopter capable of transporting six

fully equipped troops or 1600 pounds of cargo was used exclusively as a message center carrier of classified documents. H13 and H23 reconnaissance helicopters were available to do this job. During the same field exercise one rifle company had available 17 H21 Shawnee helicopters from 0300 hours to 2000 hours for a helicopterborne operation. For 17 hours the helicopters were on the ground with the rifle company and were never used.

Many commanders think primarily of using Army aircraft in single-lift operations. The speed, range, and cargo-carrying capacities of our present aircraft gives us a great capability for multiple-lift operations. In terrain which restricts ground vehicle mobility, this is a capability that gives a commander new flexibility in his operations. The speed with which such operations could be conducted with almost complete disregard of terrain offers a potential that has barely been scratched.

The Marine Corps recently conducted an airphibious exercise at Vieques Island off the coast of Puerto Rico. 1200 Marines took part in the airphibious assault from the aircraft carrier Boxer. Using only 19 helicopters, the entire assault force which included vehicles and palletized sling loads of ammunition, rations, and gasoline, were landed in nine hours.

Although commanders should capitalize on the capabilities of Army aircraft when employing them in airmobile operations, they must continually evaluate the inherent limitations. The effect of weather, maintenance, and cargo capacity are three of the most important of these limitations.

Ground commanders are well indoctrinated in the effects of weather and maintenance on surface transport--both wheeled and tracked vehicles. Combat and training experience has provided us sufficient information on which to base a decision to undertake operations in periods of bad weather with vehicles needing maintenance. We know we can overload truck transport without undue risk. If trucks break down or bog down, our operations may be delayed but they will continue.

However, in using Army aviation, known maintenance requirements must not be abused. The fact that troops and supplies will be airborne makes it imperative that engine systems do not fail during tactical operations. Weight restrictions must be complied with to insure aircraft reach scheduled destinations safely. And operations during periods of reduced visibility will continue to be limited by the capability of pilots to navigate our aircraft.

A thorough, working, practical knowledge of these capabilities and limitations will insure the best use of the maximum number of aircraft available to a unit commander. This is essential if we are to make the flexibility compensate for the limitations of our air vehicles.

After ground unit commanders are thoroughly familiar with these capabilities and limitations, unit SOPs must be developed to cut planning time of airmobile operations. SOPs have always been developed at all levels of command. These SOPs have differed widely in content and have largely reflected the desires of individual commanders. As long as an SOP is based on a unit's TOE, two or more battle groups within the same division may have different SOPs. A great deal of latitude may be given each battle group commander in their preparation.

SOPs to utilize Army aircraft, however, must be standardized at the level of command which controls the aircraft. The reason they must be standardized is to prevent confusion on the part of pilots who must operate in conjunction with many different units. In the case of organic division aircraft, the division headquarters must establish the SOP and all subordinate units must conform. With Army transport aviation battalions, Army or corps headquarters must give most of the guidance.

The guidance for use of both organic division aircraft and Army transport battalion aircraft should be the same. In this way we can insure that any aviation unit can work without

confusion with any ground unit--for the techniques for operation of loading areas, communication procedures, and operation of landing areas will be standard.

The preparation of SOPs, although an important step in training our Army in the proper use of Army aircraft, will not entirely solve the problem. Hard-and-fast doctrine must be written at the highest level. Already Department of the Army has published FM 57-35 "Army Transport Aviation Combat Operations," FM 1-100 "Army Aviation," TC 1-9 "Helicopter External Load Operations," and TC 20-1 "Airmobile Operations."

Some of the information in these publications is conflicting, and a great deal of it must be revised as quickly as experience is gained in the field. New publications are forthcoming. FM 57-35 is being rewritten and will be entitled "Airmobile Operations." Care must be exercised to insure new doctrine does not conflict with the old without timely changes being written. A change in doctrine or techniques will require changes not only to Department of the Army publications but to all unit SOPs.

The last step in the training plan, which will follow ground and aviation individual and unit training, and ground and aviation staff training, is combined training.

Here we will insure that Army units can apply airmobile concepts in their field training. Task forces with Infantry, Artillery, Engineer, reconnaissance and support elements will be formed and tested. Aviation support from the field Army should augment division organic aircraft. Command and staff relationships will be tested. Communication procedures will be worked out. Aerial weapon systems will be mounted on aircraft and experimentation conducted. In summary, combined training will emphasize the following:

1. Speed and flexibility of execution.

2. Staff planning procedures and techniques.

3. Air movement time and space factors.

4. Logistical support procedures.

5. Liaison and coordination procedures.

6. Standardization of SOPs.

So far in this presentation the implementation of TC 20-1 by tactical units has been discussed. What assistance will the Infantry School give these units? TC 20-1 directs the Infantry School to make maximum use of available courses to train instructors in airmobile subjects. Results of a preliminary study by the Airborne-Air Mobility Department indicated that additional instruction is needed if this school is to assist units by training instructors. Basic instruction in the techniques of working with aircraft as well as more advanced instruction in planning for the use of aircraft in all types of operations should be included in current courses of instruction.

As a result of this study, the Director of Instruction is presently evaluating all programs of instruction to see what is being taught, and what needs to be taught in the field of air mobility. This study will determine how the Infantry School can best implement TC 20-1.

In addition to integrating airmobile subjects into present instruction, a new course in air mobility is also being considered. This course would give both officers and enlisted men detailed practical knowledge on employment of Army Aviation. This knowledge would prepare them to act as instructors within their units.

The Director of Instruction has asked the Airborne-Air Mobility Department to submit recommendations for a seven-to ten-day course. An outline follows (Figure 4):

USAIS COURSE OF INSTRUCTION

ORGANIZATION OF ARMY AVIATION UNITS

CAPABILITIES AND LIMITATIONS OF ARMY AIRCRAFT

AIRMOBILE OPERATIONS

ARMED HELICOPTER OPERATIONS

SELECTION AND MARKING OF DROP AND LANDING ZONES

LOADING AND LASHING OF EQUIPMENT IN AIRCRAFT

TERMINAL GUIDANCE PROCEDURES

EXTERNAL LOAD OPERATIONS

SIGNAL COMMUNICATION

Figure 4.

To further assist unit commanders in the implementation of TC 20-1, the Infantry School will submit to USCONARC in January 1960 another training circular dealing with "Pathfinder and Pioneer Aircraft Guidance." The purpose of this circular is to prescribe the latest techniques used for control of aircraft in forward areas. This control is essential for efficient and safe utilization of both helicopters and airplanes. We visualize our aircraft will be controlled in three ways.

In the vicinity of established airfields, the control is exercised by aviation units and is called base airfield guidance. This guidance is the responsibility of the aviation unit, not the ground unit.

However, in airmobile operations, the ground units who use Army Aviation must provide for aircraft control or guidance in the forward areas. They will do this through the employment of Army pathfinder teams and pioneer aircraft guides.

Army pathfinders were first used in World War II during the invasion of Italy. Their mission at that time was to visually mark drop zones for the delivery of parachutists from Air Force aircraft, and to furnish navigational assistance to these aircraft with electronic homing beacons. Army pathfinders were located in airborne divisions after World War II and continued to provide this assistance until the early 1950s when responsibility for the delivery of parachutists and airdrop of equipment was assumed by the Air Force.

The Army pathfinder today, although the name remains the same, has an entirely different mission (Figure 5).

Pathfinders will furnish necessary navigational assistance to Army aircraft in airmobile operations. They are trained to operate drop zones, airplane landing zones, and helicopter

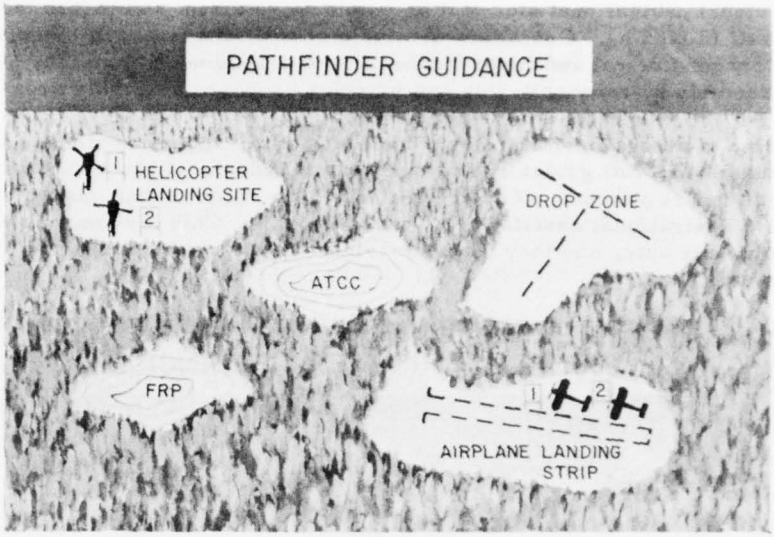


Figure 5.

landing zones for the delivery of personnel and supplies by airdrop or air landing. The navigational assistance they furnish Army aircraft consists of employing navigational aids and communication equipment to guide aircraft to drop zones or landing areas, control aircraft within these areas, and insure safe landing, takeoff, and departure of the aircraft.

Army pathfinders are airborne qualified specialists trained at the Infantry School in a seven-week course. At the present time a pathfinder team, which consists of two officers and ten men, is authorized for each aviation battalion in a field Army.

There are four aviation battalions in a type field Army, giving the Army commander the capability of employing four pathfinder teams. In addition to this capability each airborne division has been authorized pathfinder equipment and has been sending officers and enlisted men to our Pathfinder School. These men are generally assigned to reconnaissance units at division and battle group level, and perform pathfinder duties as a secondary mission.

At the present time there is no pathfinder capability within the Infantry or Armored divisions. The location of pathfinders within ROCID, ROTAD, and ROCAD type divisions is presently under study. There are currently only two pathfinder teams activated. One is here at Fort Benning and the other is located at Fort Rucker.

A pathfinder team is trained to assist a unit commander in airmobile operations and has the following capabilities:

1. Reconnaissance.
2. Navigational aids.
3. Communications.
4. Assembly.

Pathfinders will conduct a reconnaissance of an objective area. If nuclear weapons have been employed, a radiological reconnaissance of routes into the objective will also be conducted. Electronic and visual navigational aids will be employed to direct aircraft to the proper area and assist aircraft in landing. Ground-to-air voice communications will be established between pathfinders and inbound serial and flight leaders. And a pathfinder team may be called upon to assist in unit assembly by reconnoitering and marking proposed assembly areas.

The third type of aircraft control or guidance will be furnished by pioneer aircraft guides (Figure 6). Pioneer aircraft guides are designated individuals within each type of combat platoon and combat support platoon. They are trained in the same techniques which pathfinders employ to furnish navigational assistance to Army aircraft. This training, however, is in addition to their primary duty, and they furnish navigational assistance to Army aircraft as a secondary mission.

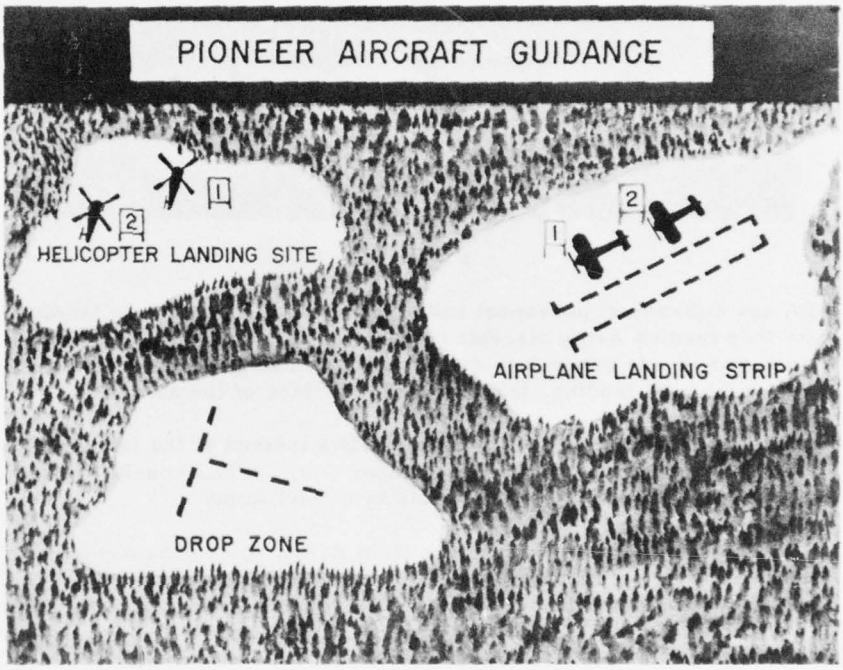


Figure 6.

Pathfinders are organized into teams and usually are employed in large-scale operations when aircraft control in forward areas is a major problem to a commander. Pioneer aircraft guides, on the other hand, are employed as individuals or in very small groups to give necessary navigational assistance to aircraft usually in relatively secure areas and for resupply or evacuation type missions.

These pioneer aircraft guides are trained in three basic type operations, but to a lesser degree than are pathfinders. Each individual should be capable of establishing and operating a drop zone for the air delivery of supplies, and a landing strip or landing site for airplanes and helicopters. They will use organic radios to control aircraft and will employ organic equipment and improvised aids to mark drop zones and landing sites.

The proposed training circular on pathfinder and pioneer aircraft guidance will set forth in detail the necessary techniques. The training of these individuals would be another step in accomplishing the airmobile training prescribed in TC 20-1. Pioneer aircraft guides, as well as pathfinders already located in our airborne divisions, provide a valuable source of instructors for airmobile training.

During this presentation, I have discussed in some detail our current thoughts on airmobile training, how units may accomplish this training which is prescribed in TC 20-1, and how Army pathfinders as well as pioneer aircraft guides will assist in this training.

Whatever the means and the methods used, the end result must be an Army which is capable of employing air vehicles instantaneously and continuously wherever they are needed.

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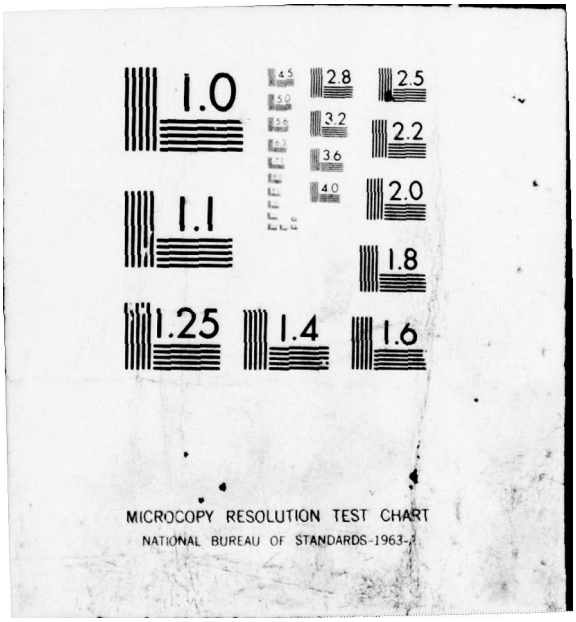
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Section III. DEVELOPMENTS IN AIR MOBILITY

MAJOR ANTHONY B. LAVITE

Technical Board Member, Airborne-Air Mobility Department

See Infantry Instructors' Conference Report (Classified Annex)

CHAPTER 8

SPECIAL SUBJECTS DEPARTMENT PRESENTATION

NUCLEAR WEAPONS EMPLOYMENT

LIEUTENANT COLONEL RICHARD W. HEALY

Chairman, Nuclear Weapons Committee, Special Subjects Department

See Infantry Instructors' Conference Report (Classified Annex)

CHAPTER 9

COMBAT DEVELOPMENTS OFFICE PRESENTATION

FUTURE INFANTRY ORGANIZATIONAL AND OPERATIONAL CONCEPTS

COLONEL CHARLES T. HORNER

Chief, Combat Developments Office

and

MAJOR JOSEPH C. HILL

Doctrine and Organization Section, Combat Developments Office

See Infantry Instructors' Conference Report (Classified Annex)

CHAPTER 10

DEPARTMENT OF NON-RESIDENT INSTRUCTION PRESENTATION

CAPTAIN ROBERT ARTER

Assistant Operations Officer, Department of Non-Resident Instruction

During your visit to the United States Army Infantry School, you have seen many of the facilities which exist here to support the training of the 15,000 students who annually attend resident instruction. I'm wondering just how many of you realize that the Infantry School supports a current non-resident student enrollment of 290,000? In this presentation we will discuss the non-resident programs in which these students are participating and the types, benefits, and methods of procurement of non-resident instructional material prepared to support these programs.

To administer and coordinate the support of the non-resident programs of the United States Army Infantry School, the Department of Non-Resident Instruction has been established.

The department is organized as follows: (Figure 1)

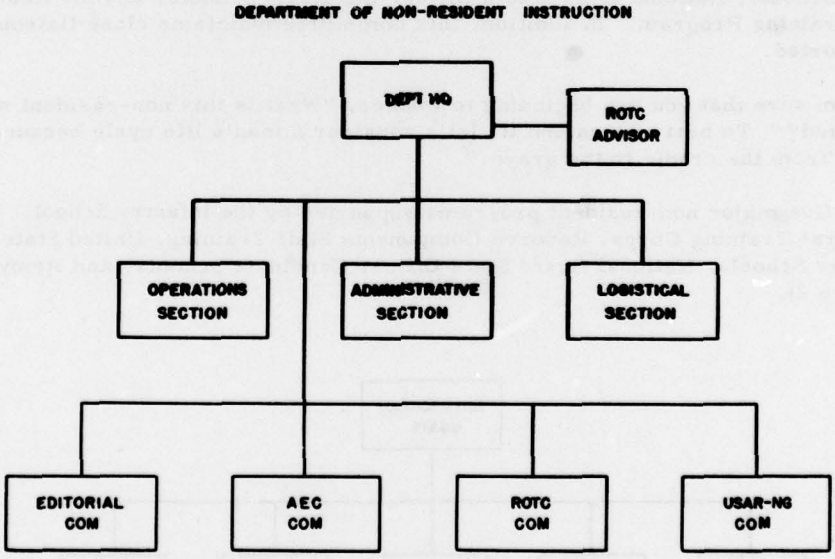

Figure 1.

There is a department headquarters with a colonel, Director, and lieutenant colonel, Deputy Director. The Director in this instance wears two hats as he is also the Infantry ROTC Advisor to the Commandant of the Infantry School.

The Operations Section has the responsibility for coordinating all activities of the department. It is this branch which serves as the department's liaison agent with all other departments and agencies concerned with the production of non-resident instructional material. Its

activities can best be likened to those of an S3 office. This section also monitors the expenditures of all funds allocated to support the various non-resident programs.

The Administrative Section performs the normal administrative duties of an S1 office. Additionally, classified documents control is a responsibility of this section.

The Logistical Section performs a dual function. It is responsible for distribution of non-resident material to individual students in the case of Army Extension Courses and to the instructors in the other non-resident programs. It also serves as the supply agency for the department.

The Editorial Committee is charged with the writing, rewriting and editing of all non-resident instructional material. It is composed of officers with considerable military experience and civilians who have had military experience and who possess excellent writing backgrounds.

The Army Extension Course Committee is responsible for administration of the Army Extension Courses; it grades student lessons and maintains extensive records on all enrolled students. For your information, approximately eighteen thousand student papers are graded weekly.

The ROTC Committee assists the ROTC Advisor in maintaining liaison with and providing proper support for over 600 ROTC units.

U.S. Army Reserve - National Guard Committee supervises the programs to support the Infantry USAR Schools, National Guard State Officer Candidate Schools, and the Reserve Components Staff Training Program. In addition, this committee maintains close liaison with the programs supported.

By now, I'm sure that you are beginning to wonder, "What is this non-resident material and how is it used?" To best understand it, let's consider a man's life cycle because our scope nearly covers "from the cradle to the grave."

There are five major non-resident programs supported by the Infantry School. These are: Reserve Officers' Training Corps, Reserve Components Staff Training, United States Army Reserve Infantry Schools, National Guard State Officer Candidate Schools, and Army Extension Courses (Figure 2).

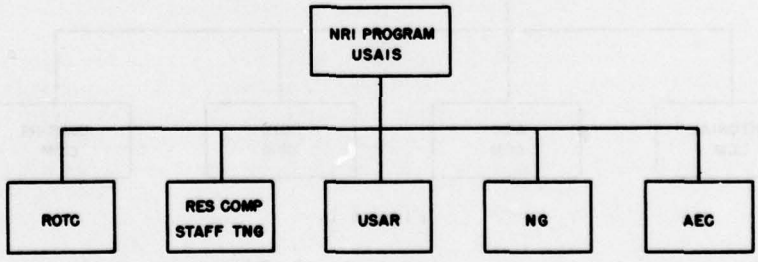

Figure 2.

Let's consider an average American boy whom we find enrolled in the Reserve Officers' Training Corps Program of his local high school (Figure 3). He's participating either in the Junior ROTC or National Defense Cadet Corps and will receive 96 hours of training in basic military subjects each year for three years. This training is designed to make him a better American citizen and to prepare him for possible service as an enlisted man. There are two types of units at this level of instruction, the regular Junior ROTC units and the National Defense Cadet Corps units training under Section 55c, the National Defense Act. The latter units are supported only by instructional material, whereas, regular Junior ROTC units are provided active Army instructors as well as training material support.

Our lad could have participated in the Military Schools Division of ROTC (Figure 3). It consists of military institutes and military junior colleges with an enrollment of approximately 13,500. These schools have a six-year curriculum with 150 hours of military instruction per year.

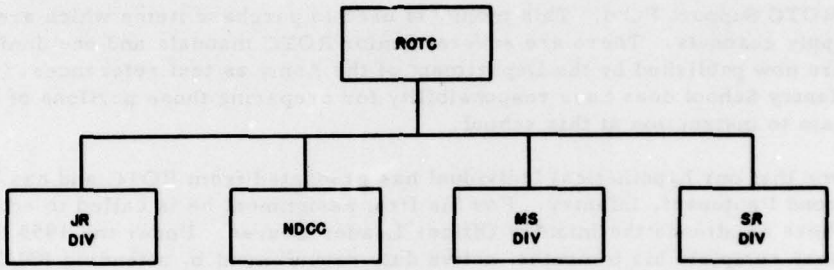

Figure 3.

Now, let's assume that our lad has graduated from high school and enrolled in college. Here he may receive additional training under an ROTC program which parallels the resident OC course. There are 249 senior ROTC units which are supported by the Infantry School; this includes 202 General Military Science and 47 Branch Material units including 17 Infantry units. Total enrollment is about 147,749. The General Military Science (GMS) curriculum is keyed to produce junior officers who by their education, training, and inherent qualities are suitable for continued development as officers in any branch of the United States Army. The Infantry branch-type curriculum, as the name implies, is designed to train officers for Infantry commissions, but both this and the General Military program include relatively the same subjects throughout their 4 years. The trend is to convert all branch-type units to General Military Science units.

A senior ROTC student receives 90 hours of instruction each year for the first 2 years and 150 hours annually for his last 2 years. In addition, to qualify for a commission, he must attend summer camp. This is normally accomplished between the third and fourth years of ROTC. Last school year, 14,500 officers were commissioned through the ROTC program with about 2000 going into the Infantry. (The Artillery branch received the largest number of officers, about 4000.)

To support the ROTC programs there are 53 subject schedules, 3 instructor manuscripts, and 1 new developments pamphlet prepared here. There are an additional 15 subject schedules and 11 instructor manuscripts prepared by other service schools but which are edited, published, and distributed by the United States Army Infantry School. Let's take a look at a typical subject schedule. The cover contains the title as well as the school year and Army Training Program paragraph which the subject schedule supports. On the reverse side is a table of contents.

Page 1 outlines the purpose, training objective, scope, references, training aids, facilities and equipment, and general information which an instructor should have to present this subject. This general information includes any training hints which the Infantry School instructor has found to be helpful in the presentation of this particular block of instruction. On page 2 is a chart of the course giving a breakdown by period and showing lesson title, text reference, area, training aids, and equipment. This is followed by paragraphs containing an outline of each hour, stating the lesson objective and showing the recommended lesson outline with a time breakdown.

At present, there are only three instructor manuscripts written here at the United States Army Infantry School. Instructor manuscripts contain complete narratives for each hour of instruction supported, and they are prepared on subjects wherein reference material may be scarce or there is a need for uniform instruction.

Additional assistance is rendered the ROTC program through liaison visits and procurement of special items such as name tags, magazine subscriptions, and books. Certain instructional items are purchased and automatically distributed. Each senior school is allocated money quarterly from the ROTC Support Fund. This money is used to purchase items which are not available through supply channels. There are several Senior ROTC manuals and one Junior ROTC manual which are now published by the Department of the Army as text references. The United States Army Infantry School does have responsibility for preparing those portions of the manuals which pertain to instruction at this school.

Let's assume that our hypothetical individual has graduated from ROTC and has been commissioned a second lieutenant, Infantry. For his first assignment he is called to active duty at Fort Benning where he attends the Infantry Officer Leader Course. Under the 1955 Reserve Forces Act he may complete his 6 months' active duty requirement by attending IOLC and then attending further schooling or being assigned at Benning until discharged. If he elects a two-year tour of active duty he's assigned according to the needs of the service upon completion of IOLC.

Let us further assume that our young man has completed his 2 years' active service and reverted to a civilian status. If he is to remain active with the military, he may participate in the Reserve or National Guard programs. Suppose he elects to join the USAR. There are two USAR activities in which he may participate.

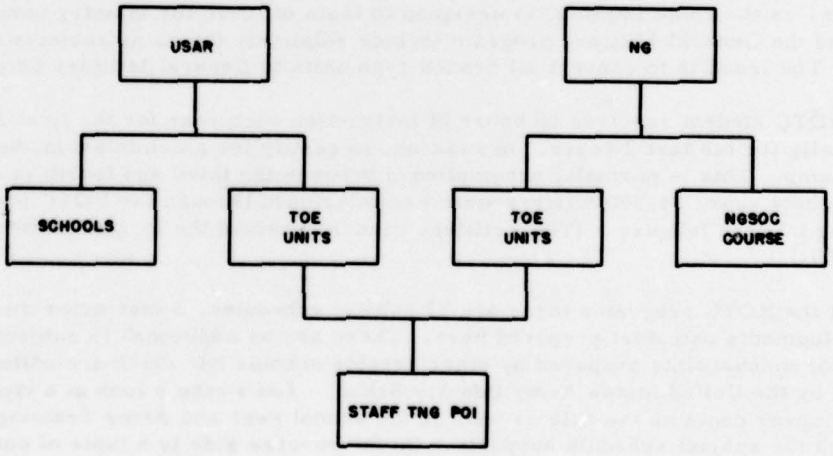

Figure 4.

The first USAR school was organized at Allentown, Pennsylvania, in 1949, and the program met with such success that today there are 149 Infantry Departments operating throughout the United States, France, Germany, and Hawaii. The enrollment is about 2652 officers (Figure 4).

What is a USAR school and how is it organized? A USAR school is run by reserve officers for reserve officers. The faculty consists of a commandant with his regular staff (S1, S3, S4) plus a special staff. The school is organized into departments based on branches with an instructor for each branch. A minimum of 10 students is required to organize a department. Since everybody involved, both students and instructors, is a civilian, the material which is prepared for them must be complete to the last detail. A civilian instructor has no library facilities he can turn to--and we don't want him to need them.

It's possible for a USAR student to spend 11 years in a USAR school. Each Infantry branch department has two courses of three years each. The USAR Associate Company Course parallels the resident Associate Company Course and the USAR Associate Advance Course parallels the resident Associate Advance Course. Each year is broken down into two phases--the active duty for training and the reserve duty phases. The reserve duty phase consists of 48 hours of instruction which is presented in the individual's hometown. The active duty phase of 80 hours is received during a two-week summer camp which is conducted at a military post. In addition, the Command and General Staff College has a five-year program for USAR schools.

Let us take a look at the type of material which is prepared to support instruction in USAR schools. A USAR problem normally consists of two parts--an instructor and a student set. Look at the heading. It contains the subject, time allotted, type of instruction, scope, subject schedule, special preparation by the instructor (included here are all details or items which the resident instructor has encountered in the presentation of this problem and which should be passed on to the reserve instructor), and special preparation by the student (the exact same study assignment that is given resident students). Note the outline of presentation, time chart, and complete narrative. At the end of each phase of USAR school instruction an examination, prepared by the Department of Non-Resident Instruction, is administred to each reserve student by the USAR school faculty. There are two established ways for you to obtain these USAR problems.

The first of these is through the Monthly List of Instructional Material. This publication is distributed monthly by the Doctrine Publications Office (formerly Editorial and Pictorial Office) to PMSTs, senior Infantry instructors at service schools, chiefs of military districts, senior advisors to National Guard and USAR units, and various other agencies. Addressees are authorized to receive without cost one copy of all problems listed therein. It should be SOP for someone in your shop to check this list closely, circulate it among interested persons, and then order your free material within 45 days. The number of addressees who fail to take advantage of this free service is surprising.

Another means of procuring these USAR problems is by order from the Book Store. This method costs you money. Please refer to your Book Store Catalog. This catalog is still current although the date does not so indicate.

Infantry USAR schools receive additional support through transparencies, special texts, and handbooks which are provided, plus liaison visits by personnel from the Department of Non-Resident Instruction.

Our hypothetical man, whom we are considering, could have elected to join a USAR TOE unit which receives no direct support from the United States Army Infantry School. This point will be expanded momentarily.

Instead of joining the USAR, our individual could have joined a National Guard TOE unit organized by his home state. We provide no special material to support National Guard TOE units; however, they may order, subject to their availability of funds, any USAR problem from the Book Store.

Both USAR and National Guard TOE units are supported by a staff training catalog which is prepared and forwarded to all state adjutant generals and Reserve Corps Headquarters. This catalog contains a recommended list of USAR school problems for training Infantry division and battle group, armored division and armored Infantry battalion staffs. This training is conducted during the periods when the companies are drilling. Material is ordered in December and shipped the next July. All National Guard material is paid for by National Guard funds, whereas USAR units receive material which is paid for by Infantry School non-resident instruction funds.

The Infantry School is the sole agency which supports the National Guard State Officer Candidate Program. At present, this program is being conducted by 42 states through the operation of 53 schools with an enrollment of 2190 students. The course is supported by 21 annexes containing 227 hours of instruction which parallel the resident Officer Candidate Course. These annexes are used by National Guard officers to teach classes, normally held on weekends, to National Guard officer candidates. In addition, most states require their officer candidates to serve in a second lieutenant's job at summer camp. This way he is evaluated as to his job performance as well as academic standing. A commission gained through the NGSOCS program does not have to be recognized by the federal government; however, it normally is when the unit is called into federal service.

Let us look at a typical NGSOCS problem. A similar problem is prepared for every period of instruction in this program. Turn to page 1 and note its similarity to page 1 of a USAR problem. Look on page 2. Here begins the narrative. Just as the USAR problems, each problem normally consists of an instructor set and a student set. The student set outlines the home study assignment that normally contains a pre-class requirement. Each phase of instruction is followed by an examination which is administered by the state and graded here at the Infantry School by personnel of the Department of Non-Resident Inst ction. Within 48 hours after receipt of these exams, they are graded, recorded, and on their way back to the appropriate state schools. NGSOC schools are also supported by transparencies, special texts and liaison visits.

Suppose now that our selected individual has grown older. Perhaps he has served several years with a USAR or National Guard TOE unit. Due to his family and business activities, he is no longer able to regularly attend meetings at the armory. However, he wants to keep active in the military and to gain retirement benefits. We have the solution to his needs--participation in the Army Extension Course Program. Army Extension Courses provide a progressive non-resident course of military instruction for all components of the Army (Figure 5)

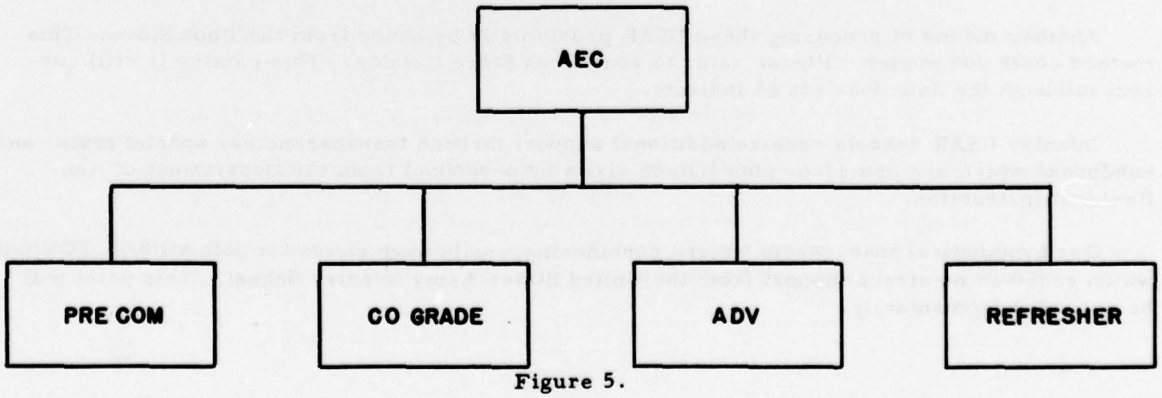

Figure 5.

Effective 2 July 1956, the Army Extension Course Program was revised from a series-type organization to a course-type organization. It now consists of the Pre-Commission Extension Course which generally parallels the resident Officer Candidate Course; the Company Grade Extension Course, and the Advanced Extension Course which parallel the resident Associate Infantry Officers Company and Advanced Courses. This school is currently preparing an Infantry Officers Refresher Extension Course which will parallel the corresponding resident course.

Any officer on active duty may enroll in any sub-course; however, a reserve student must complete the sub-courses appropriate to his grade before enrolling in more advanced instruction. For your information, the percentage of enrollment by component can be broken down as follows:

56% - NG
20% - USAR
24% - Active Army (this includes all RA, USAR, & NG personnel on active duty; ROTC cadets, WACs, and Air Force and Naval personnel).

On page 2 is the beginning of lesson 1. NOTE: At the top of the page is shown the Army Extension Course credit hours, text assignment, materials required, lesson objective, and suggestions to the student. Usually there is an introduction. As you leaf through the lesson, you will note that there is a series of general and special situations followed by multiple choice questions, normally 20 per lesson.

Turn to the back page of the booklet. This is the answer sheet which the student should tear off and mail in upon completion of lesson 1. Remember that Army Extension Courses cost the student absolutely nothing and all correspondence is handled through franked envelopes. This answer sheet is graded by personnel of the Army Extension Course Committee, and then the student's grade, along with a correct solution sheet and discussion of difficult questions, is on the way back to him within 48 hours. Students completing a sub-course receive a letter of completion through channels, while students completing a course receive a certificate of completion.

Special texts are written in the form of field manuals but are better reading and easier to understand. Everyone realizes that often the latest doctrine or techniques which you are teaching are not contained in the field manual. The only way that we can make this material available to the non-resident student is through the preparation of special texts or attached memoranda. Special texts are popular with non-resident students who are permitted to retain them for their reference library.

Conversion of Army Extension Course material to ROCID was initiated during 1958 and will soon be completed.

Actually, there are many benefits to be derived from using non-resident instructional material. Some of these are:

There may be some type of job that an individual especially desires or an assignment that he receives orders for, yet feels that he is not fully qualified to perform. By enrolling in sub-courses covering that particular type of duty, he can prepare himself professionally.

If an individual is slated to attend a service school and realizes that he is particularly weak in a given subject, he may enroll and review that subject. Chances are he will study many of the same problems and situations that he would encounter in resident instruction.

I doubt that there are few of us who have not at some time been assigned the task of presenting a class about some subject with which we were not familiar. Imagine how valuable a USAR problem with a complete narrative would be under such conditions. Everyone will agree that possession of a narrative does not make a good instructor; however, it certainly provides the best point to start preparation of a class.

In addition to Infantry sub-courses, there are also sub-courses covering all subjects taught at other service schools. These are available without cost to the student. (Examples are color television, accounting procedures, radio, etc.)

There are many other benefits to be derived from participation in the non-resident program. One is that it can enable reserve personnel to gain retirement or retention points. Three Army Extension Course credit hours equal 1 credit point. Twenty-seven points are required by reserves to remain active and 50 points must be accrued annually to qualify for retirement benefits. Also, completion of certain designated sub-courses is required to qualify National Guard officers for promotion.

During this period we have briefly discussed the organization and functions of the Department of Non-Resident Instruction, the various non-resident programs with their 290,000 students, and the types of non-resident instructional material prepared to support these non-resident programs. Further, I have pointed out the schedule dates for conversion of non-resident instructional material to the new organizations. You know now what material is available and how you can obtain it; the next step is yours.

CHAPTER 11

DOCTRINE PUBLICATIONS OFFICE PRESENTATION

COLONEL FRANCIS X. BRADLEY

Chief, Doctrine Publications Office

I am pleased to have an opportunity to talk to you because I feel that the Doctrine Publications Office of the United States Army Infantry School can be of great assistance to you in carrying out your instructional responsibilities. In addition, you can be of tremendous assistance to us because we exist largely to serve you, and by knowing your needs and desires we can better do our job.

I dare say, more than ninety percent of your contacts with the Infantry School when you are away from Fort Benning will be through the Doctrine Publications Office. If you write to the School or the Commandant for information or materials we--in all probability--will handle your request. If you have been receiving materials from the Infantry School we--in all probability--have been sending it to you.

It might be well therefore if we reviewed the organization and capabilities of the Doctrine Publications Office so you will understand what we are doing and what we can do. Then I think it would be well if we spoke briefly of how we could better serve you and how you can help us.

Unlike the academic departments of the School, we conduct no instruction and we present no demonstrations to which other people at Fort Benning or the public might be invited. Actually, we work pretty much behind the scenes. Yet we support every department in the School and we assist the Commandant to fulfill a number of important responsibilities to the United States Continental Command and the Department of the Army.

To keep this presentation as brief as possible and to avoid repetition, we shall discuss how we do this as we look at the various sections of our office. We have prepared a chart which shows the framework within which we work.

Within the organizational structure of the School, the Doctrine Publications Office operates under the direct supervision of the Assistant Commandant. It is a staff office and like the other staff offices such as Combat Developments Office, Operations Office, and the office of the Director of Instruction, it supports all of the academic departments of the School. As this chart shows, we have an administrative office . . . an operations section . . . a training literature section . . . a training film section . . . a special editing section . . . and an Infantry magazine section. We also have supervision of the Infantry School Book Department and the Third Army Field Printing Plant.

The administrative office needs little explanation. It performs the normal functions of such an office in any organization. It maintains our personnel records and classified documents files; receives, distributes and dispatches our correspondence; and performs other administrative functions.

We shall now take a brief look at our operations section. This section is a clearing house for Army-wide requests for training literature and other printed materials produced at the Infantry School. It publishes a Monthly List of (all available) Instructional Material which it sends to several hundred addressees. Among these are other service schools, Military Advisory Groups, Military Missions, Senior Military Advisors of the National Guard and Army Reserve Units. The purpose is to provide information laterally within the Army to other schools and

agencies responsible for the conduct of instruction. Upon request, the section furnishes authorized units and individuals with one copy of each item desired. Additional quantities must be purchased from the School's Book Department with funds which they have available for such purposes.

The operations section also receives and processes all queries for information--on any subject--which are generated by this literature. When necessary, the queries are staffed with the appropriate instructional departments for information on which to base replies.

One of the major functions of this section is the preparation of all artwork required for the numerous manuals, visual aids and other instructional materials required by the School or for which the School is responsible, and for furnishing advice on visual aids and presentations.

This requirement includes art for Department of the Army field manuals, graphic training aids and transparencies for Army-wide use, for resident training literature and for Infantry magazine.

To accomplish this the section has an art department which is headed by a civilian art director and which is authorized 10 enlisted artists and 4 civilian artists. The work turned out by this department varies from simple organizational charts to very complicated color illustrations and cutaway views of weapons. It requires draftsmen, illustrators, photo retouchers and other specialists. The voluminous amount and variety of artwork required will be more apparent as we look at the responsibilities of the other sections of our office.

Next, we shall consider the training literature section. This section has three major functions: (1) it supervises the preparation of, edits and processes for publication, all official Department of the Army training literature for which the Infantry School is responsible; (2) it performs the same functions for the "Special Texts" required specifically by the School for resident and nonresident instruction and (3) it reviews and edits comments on Department of the Army training literature prepared by other service schools and agencies in which the Infantry School has an interest.

I should point out that, except for the special texts, this section has no responsibilities in connection with the instructional problems and other literature used in resident instruction. These materials are prepared by the instructional departments. Nor does the training literature section write the Department of the Army manuals or the special texts. The original drafts of this literature are written by experts in the various departments of the School. The section does, however, provide guidance to the writer concerning preparation of the material. It sets deadlines and coordinates between departments, especially when more than one is involved in a single text.

After the draft has been written, the training literature section performs the necessary editing and rewriting to insure proper standards, uniformity and style. It then reproduces sufficient copies and staffs the edited draft with other schools or agencies and ultimately obtains approval of the manuscript from Headquarters, Continental Army Command and from Department of the Army. The manuscript is then forwarded, along with all art and photographs, to the Government Printing Plant in Washington for publication.

The magnitude and importance of this function is evident when we consider the number of items for which the School is responsible and the purpose for which they are prepared. The Infantry School is responsible for 55 field manuals of varying sizes, many of which run several hundred pages. The School is responsible, also, for three technical manuals and for 10 Reserve Officer Training Corps texts which are used for the training of ROTC students in military schools and colleges throughout the country. In addition, it is responsible for the publication of 10 Army Training Programs and 68 Army Subject Schedules which delineate the subjects and hours of

instruction for Army-wide training. And, it supervises the preparation of 19 Army Training Tests. Finally, it is responsible for the preparation of necessary changes to keep these texts current until new ones are published.

As I have already mentioned, this section performs the same function on special texts used in resident instruction such as the Continental Army Command Training Text and Infantry School Special Text. The number of such texts varies as this generally concerns new items for which a field manual has not yet been prepared.

As you know, all of these manuals together constitute the "bible" of the Army. They are the basis for all Infantry training. In peacetime they affect hundreds of thousands--during mobilization and war they affect millions. They must be the very best we can produce.

Next, we'll look briefly at the training film section. This section supervises and coordinates all Department of the Army training films and film strips for which the School is responsible. The number of films varies since the requirement for new films stems largely from the development of new weapons and equipment and new tactics or techniques for their employment. The requirement may be generated by Department of the Army, Continental Army Command or by the School or units in the field. However, Department of the Army approves the making of all films and establishes the priority which each will be given.

The material to go into each film is developed by the academic departments of the School and a technical advisor is assigned for each film by the department responsible for the subject to be covered. When an outline of the subject has been drafted, the training film section arranges for a professional script writer to come to the School from the Army Pictorial Center at Long Island City, N. Y. The writer and the technical advisor, with the guidance and assistance of the film section, then produce a treatment plan. When this has been approved by the School, a final script is prepared and the section arranges for a camera crew from the Pictorial Center. Normally, most of the filming is done at Fort Benning under the supervision of the film section and the technical advisor. Occasionally, some footage must be shot elsewhere. When the film has been edited, an answer print is returned to the School and the section arranges for its review by representatives from all of the academic departments. After approval at Fort Benning, it is forwarded to Continental Army Command and Department of the Army for final approval and for printing and distribution by the Army Signal Corps. At the present time, the section has approximately 41 films in various stages of preparation.

We shall now consider the special editing section. This section has a number of editing and writing responsibilities. One of the important tasks is the preparation of the Commandant's Periodic Letter to Field Commanders. To keep senior Infantry commanders in the field advised of the latest trends and developments and to provide for an exchange of information and thinking between the School and the field, the Commandant sends a personal, periodic letter to senior commanders in the Active Army, the National Guard, and the Army Reserve. The special editing section, after receiving the material and guidance, prepares individual letters and an attached list of items of interest for each addressee. The section also edits and prepares for publication all special brochures required by the School, such as the "Handbook for Students." It also assembles and prepares the quarterly Infantry School Notes which go out over the Assistant Commandant's signature to you and others--some 700 Infantry instructors in all--throughout the Army. These notes are designed to keep you up-to-date on new developments and instructional materials and techniques of the School. The section also maintains biographical files and prepares speech introductions for all speakers who come to the School. On occasion, it is called upon to assemble material and prepare drafts of speeches for Infantry School speakers or for speakers outside the School who wish to talk on an Infantry subject of current interest. The section also prepares articles on important subjects for publication in service journals and other publications. Since much of this material prepared by this section carries

the Commandant's or the Assistant Commandant's signature and since it directly represents the School to the public and to senior commanders throughout the Army, it must be of the highest possible caliber.

And now just a few words about Infantry magazine. Infantry is an official publication of the School and the professional journal of our branch. Actually, it is an extension of Infantry School instruction which is designed to keep Infantrymen of the Active Army, the National Guard, the Army Reserve and our allies acquainted with the latest developments in Infantry organization, weapons, tactics and techniques. It bridges the gap between new developments and their publication in manuals and other literature which take longer to produce and distribute. It also provides a forum for provocative thinking which may stimulate new ideas or techniques to improve the Infantry. Infantry is considered one of the most authoritative military publications available today. It has been recommended as essential reading for all Infantrymen and for members of the other branches who work with the Infantry by the Secretary of the Army and by the Army Chief of Staff.

Appropriated funds have never been used for this publication. It is financed entirely by the sale of subscriptions. I might add that we have many subscribers among interested civilians and business firms who find it a quick and easy way of keeping up with what this large segment of the Army is doing and what types of equipment it needs or would like to see developed.

And finally, I want to mention briefly the Army Field Printing Plant and the Book Department.

The printing plant is a rather sizeable operation. It is authorized two officers, 52 enlisted men and 54 civilian employees--more than double the 51 persons authorized for the remainder of the Doctrine Publications Office. This plant produces more than 90 percent of all the printed material required for the Infantry School's resident and nonresident (extension course) instruction. It also reproduces material for Third Army units which include the Infantry Center--as distinguished from the Infantry School. In an average year it will reproduce more than 180 million individual sheets of printed material.

A few of the many types of work turned out by this plant are indicated on the chart. For example, large quantities of maps are overprinted for tactical instruction. The maps themselves, however, are not printed at Fort Benning but are furnished by the U.S. Army Map Service. (A large supply of appropriated map sheets is kept on hand at all times.) The printing plant also produces large quantities of map overlays which are used to present changing tactical situations and solutions. Among the other materials printed are advanced study sheets for most periods of instruction, a wide variety of charts and all of the special texts and other literature mentioned earlier, except the Department of the Army publications which are produced by the Government Printing Office.

The handling of such a large volume of work and the delivery of materials in advance of their need for instruction requires tight scheduling and simplicity in operations. Most of the work must be standardized and almost all of the printing must be done in one color--usually blue, as in the case of the overprinting, or black.

The Book Department consists of a retail store and a mail order business. The book store carries stationery and other items needed by students in their instruction. The mail order items include books, and as I mentioned earlier, the manuals, tactical problems and other training literature produced at the School which may be purchased by authorized units and individuals.

Now, how can you help us so that we can better help you?

First, we must know your needs. If you need training literature, write and tell us exactly what it is you need. If the materials are available, we will ship them to you immediately. If the need is a broad one and no material is available, we will attempt to have some prepared. If you feel that a training film could better help you do your job--or a film strip, or a series of transparencies, or a device of some sort--let us know. If you don't request these materials, there is a good chance that you will not get them. The faculty here at the Infantry School recommends the production and preparation of literature, films and other materials for the use of Infantrymen worldwide, but they cannot hope to predict all of your requirements. After all, their primary mission is resident instruction here at Fort Benning. Your responsibilities and problems are often quite different.

So, let us know what you need and, within the funds and resources available to us, we will try to get it to you.

Secondly, we must exchange information. If the Infantry is to progress, there must be a continual exchange of new ideas. Let us have your comments on new doctrine. Let us know when you think we are wrong. Let us know how we can improve or refine techniques and procedures. Let us have your thoughts and solutions to new problems.

Thirdly, you can help us with Infantry magazine. It is my opinion that we can make Infantry the forum for the exchange of new and stimulating ideas from Infantrymen all over the world. I also believe that the magazine can be the medium which ties Infantrymen together, which enhances the prestige and esprit of the doughboy, and which advances the interests of the branch and of individual Infantrymen. Both General Freeman and General Larsen are giving complete support to the magazine and have solicited help from senior commanders in the field. We think with additional support from you, we can produce a magazine which will be extremely useful to all Infantrymen and which will have a significant effect on the development of new thought and doctrine. With your help, we think we can give Infantrymen a louder and clearer voice to explain our role in future war and to exert influence on thinking and decisions within the Army and the Defense Department.

You can help the magazine in two ways: First, by encouraging officers and noncommissioned officers to send us their ideas on how we can improve the magazine and to submit good thought-provoking material for publication. We want all the stimulating thoughts we can get and we will pay for them according to their quality and length. Secondly, you can help by encouraging officers and noncommissioned officers to subscribe to Infantry. If we can get all career Infantrymen to support the magazine, I am confident that we can make it the most authoritative and influential military journal in the country.

I honestly believe that a subscription to Infantry should be regarded by career Infantrymen as an investment in the future of their branch and in their own future as well. In my opinion, the magazine can be made as important to Infantrymen as a medical journal is to a doctor. Our career personnel have an obligation to stay abreast of developments in their profession just as other professional people are obliged to in theirs; in fact, our obligation is an even stronger one. With your help, I think we can develop a magazine that is truly professional in every sense of the word. I think you will also agree that there should be several copies of Infantry in every Infantry company dayroom and every Army library and a subscription is most suitable as an award for "Soldier of the Week" in Infantry units.

If any of you have questions as to how you can obtain school publications or materials, I would be pleased to try to answer them. Also, we would be pleased to have you visit the Doctrine Publications Office while you are here and have you meet the people with whom you correspond.

With all my talk, I have been trying to make only one point. It is this: We are trying hard to serve you and furnish you with the information and materials you need to do your jobs better. We can do our job better if you will let us know--while you are here and after you leave--your needs and your suggestions for improving our materials and our service.

CHAPTER 12

INSTRUCTOR TRAINING SECTION PRESENTATION

Section I. INTRODUCTION

CAPTAIN JAMES R. BURNS

Instructor, Instructor Training Section

This morning we are going to teach you the secret of presenting the quality of instruction that we maintain at the Infantry School. The secret is twofold; first, careful organization of instructional material, and second, training our instructors. It is important that you know how we operate at Fort Benning because you may be able to use the same techniques in training your instructors and organizing your lesson materials. Our primary job in the Instructor Training Section is operating the Instructor Training Course - a three and one-half week course which is given to all new instructors at the Infantry School.

We also have some other missions. We develop and improve instructional aids and techniques for use in the Infantry School. We assist instructional departments by providing inspection of instructional procedures and, when necessary, retrain instructors. Of course our primary job is operating the Instructor Training Course. In this course we train the officers and selected noncommissioned officers who are assigned as instructors at the Infantry School. What do we teach? Primarily, we build upon their backgrounds. All of our instructors come to us with military experience and with civilian schooling experience. They are not new to the instruction game. Upon this background we add the content of our Instructor Training Course. We have thorough instruction in speech techniques, instructional methods, evaluation and testing, and related subjects. These related subjects have to do with the facilities available at Fort Benning and Commandant's and Assistant Commandant's policies. Scattered throughout the periods of formal instruction we have periods of practice teaching which prepare the student to step onto the platform and take over instructional duties here at the School. Upon graduation he goes back to his committee for further supervision and in-service training to learn the problems that he will give at the Infantry School.

LESSON PREPARATION AND CONTROL OF INTEREST

Let me preface my remarks by saying that the manuals, the references which are used at the Infantry School for methods of instruction are the manuals which most schools use. We use FM 21-6 as our basic reference and we have certain civilian texts which we use for other areas such as evaluation. But, basically, FM 21-6 is the manual which we use. Now we have taken certain parts of FM 21-6 and modified them slightly as you will see as we go through this discussion. Every problem presented at the Infantry School and as taught in the Instructor Training Course is organized the same way. Each problem has three distinct parts or phases. These phases are the introduction, the body and the conclusion. Into these three phases or parts we incorporate the stages of instruction as outlined in FM 21-6; we use the five stages of instruction and we place them in our lesson planning and in our presentations at the point where they would logically come. Within these three parts we will have preparation, presentation, application, examination (when appropriate) and the discussion or critique.

The first part, as I mentioned, is the introduction. We have two distinct reasons and requirements for giving the introduction, and in our lesson planning, in our lesson preparation,

each instructor organizes his lesson or his introduction in the following manner: he organizes his lesson in such a way as to have a distinct attention gaining step, and, secondly, he has an orientation. These two parts of the introduction are always present. We have recognized the fact that we cannot hope to orient our students unless, first, we are sure that what we are going to say in the orientation is being heard. For this reason, we gain the attention. We can do this in any one of a number of ways, from the instructor moving out and just beginning his talk, or by welcoming the class once in the morning, and once in the afternoon, or by having a starting statement pertaining to their lessons. By telling a story related to the lesson which has not as its purpose to teach but has solely as its purpose to gain the attention. Rhetorical questions can be used to gain attention. The use of testimony, skits, and illustrations--historical or otherwise. These are some of the ways which we gain attention at the Infantry School. The point is at the beginning of every problem (not the beginning of every period but the beginning of every problem) we do something to gain attention. And we at the Infantry School plan this and put it in the lesson plan and it becomes a part of the vault file.

The second part of the introduction is the orientation. In the presentation stage of instruction in the introduction of the presentation there are normally two requirements; i. e., stating your objectives and your reasons or motivation. We have gone just a bit beyond that and in our orientation we have three mandatory requirements and two bonus requirements which we use when they are applicable. The first of the orientation is the lesson tie-in. We organize our instruction and present it so that the students understand where, in relation to the overall block of instruction or the overall program of instruction, this particular material fits. This is good because students can be informed and will know at the beginning of a problem that this is the first of 12 or that this is the last of 4 problems. They also know then that this instruction, e.g., logistical instruction, fits into the overall block of subjects presented by the Command and Staff Department. Many of our committees have adopted as a lesson tie-in the process of preparing a big chart. On this chart they list the total hours or problems that each class will receive from this committee, and as each class or problem is started they place a red spotter by the problem being presented so that the students know that they have three or four to go.

Our second mandatory step in the orientation--by the way these do not necessarily come in the order we have listed them; they come in the order that is most logical--is the motivation. Why is this important? This is the same as FM 21-6; they mention reasons; we say motivation. Not why is this important as far as their future is concerned, that is, "if you don't know this you'll not do your job well in combat," but why is it necessary now? Why do they need to know this, and why are they receiving it at the Infantry School? At the Infantry School, as in other schools, a class is not presented unless there is a need for it. But what is the need? Here we tell them what that need is. Why they need to know this, why they are receiving this at this time, and we spend as much time in motivating or explaining why the material is being taught as we do with any other step in the orientation.

In the third requirement, the scope or the statement of the objectives--what will be discussed or accomplished during this period?--the lesson "objectives." This is different from the overall lesson objectives as found in the Program of Instruction. Here we state specifically what we are going to cover during this period, not just that during this period we are going to discuss lesson organization as presented at the Infantry School, but that during this period we are going to discuss lesson organization as presented at the Infantry School to include the preparation of the introduction, the body, and the conclusion, and the use of teaching points. Our students receive in the first week of training here, a class which shows them how Infantry School instruction is organized, and they are encouraged to take notes on what the instructor says in the orientation. In taking notes on the scope, the student can make a mental check on his notes saying, "This has been done." These three are mandatory requirements for the orientation. In addition to these, when it is appropriate, the instructor will plan to present the methods used to tell the students what type of instruction they will be receiving for the rest of the morning or

the rest of the problem. This is especially beneficial when we are presenting multiple methods, when you are going to have a discussion or conference now and this afternoon you are going to move out into the field and actually do it, or we are going to have a one hour lecture now and then we will have a demonstration later. And finally we say we can point out application. When will this material be used? Not "You'll need this as future battle group commanders and staff officers," but when specifically will they need it? Three days from now we will go to the field and conduct this air landed operation, or four days from now we will have a Command Post Exercise on this material. So these five requirements then are designed solely to orient, solely to let the student know what is coming, why it is coming, and where it fits in. This then is the orientation, the second part of the introduction. Gain attention and orient the student.

After this has been accomplished in the planning of our problems, we next prepare and present the body. In planning the explanation, if you will, or the presentation stage of instruction in the past, we have read, heard, and perhaps used main ideas, main elements of discussion, primary areas of discussion, student outcome of learning, principal points of the lesson. All of these we've heard. We do the same thing, and we put these in the body, only we call them teaching points. After the preparing instructor has determined his lesson objective, coming from either the Program of Instruction or from the lesson directive written by USCONARC or by the Infantry School, he sits down and he says, "O. K. how many main or principal areas of discussion do I have in this problem?" And for each one of these main elements, or statements of fact, we prepare what we call a teaching point. Specifically and technically, the definition for a teaching point is this: a teaching point is a statement in complete sentence form of a specific and significant principle, doctrine, technique, skill, or element of knowledge that students should understand and/or apply as a result of this period of instruction. That is the definition. Purely and simply, it is a principal part of a lesson, a principal area of discussion, and we organize our instruction by deciding we have four or five main ideas or main elements or main facts. I put these in sentence form and then I start teaching.

Certainly we cannot, just in our planning in the body, prepare four or five teaching points for a four-hour period, put it there, and let it ride. We have to do something to teach these teaching points and we do this by supporting material. After we have decided upon a teaching point, then we go about making the student understand. This is what we call supporting material. What is it? It can be just what I am doing now, explaining. It can be a discussion, where the instructor asks questions and gets answers from the students and guides the discussion to an understanding of the teaching point. It can be the use of training aids. It can be a demonstration or a skit. It can even be an examination or a practical exercise, a field exercise, or a map and terrain exercise. Anything that is done from a platform in planning to teach the teaching point is supporting material. Here is where we start incorporating the stages of instruction into their logical place. If we find that by application we can best teach, then we will have the application stage of instruction under a specific teaching point. If we find we can best teach by an examination, and we certainly can, then we'll have an examination under a teaching point. So these are the types of supporting material which we use, teaching point by teaching point, to accomplish our lesson objective. As the instructor plans his teaching points, as the instructor prepares the main elements of discussion in the problem, he concerns himself with the relationship of one teaching point to another. He concerns himself with how these teaching points can be most logically arranged so that one will follow the other. By known to the unknown and simple to the complex. As he does this, he plans the use of transitions. You and I have been using transitions for a long time. This is a method whereby we move from one point to another. We have found that transitions are so important that we plan them and actually include them in the lesson plan. For example, the questions that the instructor asks, or the subsummaries he uses are used to move smoothly from one point to another and therefore, are planned and put in the lesson plan. The body contains, then, teaching points, material supporting teaching points like questions, explanations, discussions, skits, etc., and transitions.

Logically, the instructor now plans and presents the conclusion. Our conclusions have four mandatory requirements. The first is to maintain attention. If we were to be asked which part of any period of instruction is the least important, probably you and I would say the conclusion because this is the part that receives probably the least concern or the least preparation. This should not be so, because in the conclusion you are going to point out the main part of the problem. And in the conclusion you are either going to leave the student with a good taste in his mouth or you are going to leave him feeling that this left him cold. An attention maintainer is designed to insure that we have the student's attention, so that we can proceed with our conclusion. This may be a smooth transition from the body into the conclusion. It may be a demonstration, it may be a skit, it may even be a joke. But something is done so that the instructor can be sure that the students are still listening as he goes into the conclusion.

In the summary we restate the lesson objective. "During this period we have discussed lesson planning and preparation as used at the Infantry School." And then as the third mandatory part of the conclusion, we summarize teaching points. "Specifically, gentlemen, we have learned this, this, and this." So that as in the introduction, our summary in the conclusion is specific. We point out the practical application. We could do this in the orientation, as I said, but we must do it at the conclusion as well. Show them where this material will be used and when it will be applied here at the School or in the field. Finally we need a strong closing statement. We say that this stimulates the action - at least it further emphasizes the importance of the problem.

These then are the three parts of any lesson, regardless of the type lesson, regardless of the class that receives them. The introduction, the body, and the conclusion.

You have seen a demonstration. A demonstration is one of four methods of instruction which are used at the Infantry School today. Only four, or a combination of these four, are used. The first method of instruction which we teach at the Instructor Training Section and which is used at the Infantry School is the lecture. The pure lecture where the instructor stands and for 50 minutes or for 2 hours gives the presentation and receives nothing from the students. There are very few lectures, as such, presented at the Infantry School. Why? Because we do not feel that this method will accomplish the most learning. So for this reason, normally, we use one or a combination of two others.

The second method is the conference, the exchange of ideas, if you will. Call it a discussion, call it a guided discussion or a seminar. It is where the instructor asks questions, and by his asking of questions and controlling student answers, and by further questioning the students, they arrive at certain preestablished objectives, where they arrive at an understanding of teaching points. We familiarize our students or prepare them for this discussion or conference by the use of home study assignments, so that when they come to class they are prepared to discuss the lesson. They are prepared to, by a discussion, and by the instructors summing up and furthering of the discussion, arrive at these preplanned teaching points or objectives. That is the conference method.

The third method of instruction which we use is the demonstration which can be used any time for any subject; normally, as supporting material. The demonstration is employed to teach, primarily, by being combined with discussion in a conference. The fourth method of instruction which is used, and used predominately, is the problem method or the practical exercise--the situation-requirement whereby the students are placed in a role. Students are given a situation and a requirement and, as a result of certain principles which have been established and understood through the discussion or conference, they arrive at solutions. We feel that the combination of the conference or discussion and the problem method is the best method to use. Where we can have a discussion, let them arrive at certain facts, and then apply those facts as soon after as possible by the use of problems - we have the best, we have the optimum, and these methods which we teach and which are used primarily.

Additionally, in planning our lesson--after understanding the three parts of a lesson--there is one other item that the preparing instructor concerns himself with, and this is the interest and control of interest. Certainly our students are, as at all service schools, captive students. They come here as part of their professional training and they are charged then with the responsibility of learning. It is up to you and me to insure that they want to learn and are interested in each specific problem. We do this by the integration of certain interest factors into every problem. The interest span, that time which we can hold the interest of the student without it lessening or waning, has been estimated in some books as three minutes; others as five, and still others as eight minutes. That is, eight minutes that you could talk using one approach and have the students listen to you and be interested. We do not feel that the interest span, as such, is a distinct time. We have, in preparing our instruction, had our instructors go through certain analyses or certain estimates. We consider the nature of the subject that we are presenting. Is this normally a dry subject? What time of day does the class normally receive this problem, the first hour on Monday, the last hour on Friday, the first hour after lunch or during the middle of the afternoon? Because, certainly, this will affect the amount of time students will be interested in any one approach. We consider what the class has had before, what they will have after. Are they going to be faced with a four-hour examination, have they just come from a four-hour examination? And as a result of these considerations, we determine that we must integrate interest factors into our lesson every so many minutes or here, here, and here. Some of these interest factors which we integrate are the same factors which we use to gain attention. We tell a story; we tell a joke; we use practical exercise, we ask a question, rhetorical or otherwise. But the point is that the instructor must realize after this analysis that there are certain things he must do throughout the problem to maintain interest. We do this by analyzing each interest span as it applies to each class.

Everything that we have said up to now deals with lesson planning and lesson presentation as a result of this planning. What do we feel needs to go into the person who presents this well-planned lesson? We recognize that there are certain factors which go into the overall attitude of a good instructor. These factors are not new, but these are the factors which we concentrate on at the Instructor Training Course. We feel that in order to be a good instructor there are four qualities which must be possessed. First, sincerity. There are two types of sincerity that instructors will learn to possess. One is that they sincerely believe in the subject that they are teaching. And two, that they believe in their job of teaching. This sincerity can be acquired. It can be acquired by knowing that the material that is presented is accurate and effective because of thorough research; by knowing from experience what the need for this knowledge means, and what not having this knowledge can do. Secondly, by believing that only by good platform instruction can students learn and learn well, that by presenting material from the platform you can accomplish so much more than you can from the written word. Our instructors are trained to believe in these. And the belief in these two accomplishes this factor of sincerity.

The second factor is confidence. Confidence again in two things: confidence that he knows all the methods of instruction and all the instructional techniques needed to present good, sound instruction. And he gets this confidence by practice; he gets it by having someone listen to him; by being critiqued. Confidence in the material which he is presenting. Confidence that the Infantry School instruction is the ultimate, that it is flawless, because we have researched it, because we studied it, because we have revised it, because we are confident that we have what is the latest word. This is the second factor - confidence in his ability, confidence in his material.

And thirdly, enthusiasm. This is not to say that we feel that every successful instructor or every good instructor should be the type of person who rants and raves and prances over the platform and jumps up and down. Enthusiasm can be learned. Enthusiasm can be expressed

through practice. Some of the ways which we express enthusiasm are by our movements, by the use of our voice, by the rate with which we speak, by the attentiveness with which we present our instruction, and by the concern we give our students, and each one of them through practice and through concern can be acquired. There is such a thing as acquired enthusiasm.

The fourth factor which goes into the overall attitude is humor. Having a sense of humor. Knowing that it takes humor to make a class react favorably. You do not have to tell a joke every five minutes to have humor, but be alert to humorous situations. Some of the funniest things that ever happened at this School have happened because the class did something. And if an instructor can take this situation and make it work for him by recognizing humor and by going along with humor, he will be that much more effective. It takes a class about two seconds to pick up a false instructor. It takes a class about that long to pick up an instructor who has no humor at all, and an otherwise well-planned, and well-presented class can fall flat on its face because the instructor does not possess humor. These four factors then go into the overall attitude of a good instructor - sincerity, confidence, enthusiasm, and humor.

This, gentlemen, is how we organize and present instruction at the Infantry School. We organize it into three parts - the introduction, body, and conclusion. And into these three parts we put the five stages of instruction as they apply, as they come. We recognize that there are four methods of instruction and that we feel that two of these, a combination of two of these--the conference and the problem method--is the optimum. Interest span is something which is recognized and applied after a class analysis. And the Infantry School instructor or a good instructor possesses four factors which make up a good attitude - sincerity, confidence, enthusiasm, and humor.

ORIENTATION ON THE INSTRUCTOR TRAINING COURSE

Now that you have an understanding of fundamentals of proper lesson preparation as taught by the Instructor Training Section, it shall be my purpose to orient you as to how the course is actually conducted. The purpose of the course is to assist the individual student instructor in developing his ability to present effective instruction. Our classes will normally run from 50 to 60 individuals. These are both officers and NCOs. We take this group and break them down into smaller groups of eight, segregating the NCOs from the officers. We use the figure eight as the optimum, because we feel that this is the maximum number that we can handle effectively in the time alloted during the practical exercises which I will go into in a moment. This will vary. Occasionally we have groups of 9 or 10, and that, of course, is based on the strength of the classes we are conducting. Normally, we use groups of eight. Each of these groups is assigned an instructor from the Instructor Training Section. This individual is known as "the group instructor." He is responsible for the training of these individuals during their practical exercises. It is largely through his effort and the manner in which he conducts himself throughout the 3 1/2 weeks that we guide the individual in increasing his ability, to present effective instruction. We make a very simple approach and progress to the more complex, from the known to the unknown, if you will. We do this through the method of distributed practice.

We start initially with a 2-minute personal history. That is to say, the individual is called upon and he mounts the platform, and in two minutes presents a personal history discussion of the highlights of his particular life. The reason for this presentation is to allow the individual to get on the platform and to become familiar with it. This is the period in which we break the ice. It gives us an opportunity to see the peculiarities that we are going to work with in this given individual.

From the 2-minute we move directly into the 3-minute presentation. This, again, is on a subject of his own choosing. Why? We feel that in this period by allowing the student to bring into the classroom a subject that he is interested in, we will have a very good chance of seeing

whether he has sincerity, whether he can engender a little enthusiasm, and whether he can speak fluently. This is why we allow him to speak on a subject of his own choice. We make a tape recording during the 3-minute presentation, and at the conclusion of the presentation we play it back to the student. This is designed to allow him to actually hear himself and conduct a self-analysis. In this light he will have a chance to see whether he is effective, whether his rate of speech is fast or slow, or whether he spoke in a coherent manner. These are all cited by listening to the tape that we allow him to hear after he has made his presentation.

From the 3-minute we go into two 5-minute periods. The first 5-minute period will be an expansion of the 3-minute presentation, only in this period we ask the student to interject a joke or humorous situation. He will speak on the same subject, but now we have a practical exercise whereby he must bring into his presentation a humorous situation. It allows the student to experience difficulty of presenting humorous situation. Moving from there the second 5 minute presentation will be a demonstration. Here we requested the student bring to the classroom an object, a training aid, if you will. Whereby we now allow him to gain the experience of presenting a period of instruction whereas a part of the period an object is introduced which must be explained. It gives him a practical approach to the difficulties that arise when he must maintain the interest of the class, but must devote attention to the object and the explanation he is making. This is the sole purpose of this particular period.

We have progressed from 2- to 3- to 5-minute periods, and now we go into the 10-minute lecture. Here for the first time we will require the student to present, prior to moving up to the platform to conduct his lesson, a lesson outline to his group instructor. Why must he do this? The purpose is to see whether or not the individual understands the principles of proper lesson preparation; and also it allows us to determine whether or not, once he has been able to plan this lesson on paper, he has the ability to step up on this platform and present the period effectively, using the lesson plan as his outline. So we have a two-fold purpose to see if he understands the principles and then, once having an understanding, whether he has the capability of effective presentation. Beginning with this period we allow the students to critique one another. Up until this time, the group instructor has handled all critiques. Why? We have found through experience that initially every individual who is assigned as an instructor needs a pat on the back to get him started. So we have curtailed student critiquing until the 10-minute period, allowing us, the group instructors, to critique him solely on his attributes pointing out those things that he does possess that are understanding. Through this method we begin to instill the confidence that is so vitally necessary that we have before he can become potentially as effective as we hope he will be when he graduates. Beginning with the 10-minute lectures the students begin to critique one another. Now, he gets a chance to listen to seven different people telling him what they think of the presentation. He can evaluate these remarks as he goes along.

Now from the 10-minute lecture we move into a 15- to 20-minute conference. The subject the individual spoke on during the 10-minute lecture will now be expanded into a 15- to 20-minute conference. That is, during this period he will now teach using the conference method of presentation. If we find an individual who has done fairly well throughout the course, but has difficulty in presenting the conference, we may ask him to come back during the next practical exercise and speak on the same subject. Or we may assign him an entirely new subject on which he will conduct his second 15- to 20-minute approach. Normally, this is the procedure that we follow. Why? We do this to give him another opportunity to present a new subject, a 15- to 20-minute presentation. This necessitates additional research, planning, and rehearsal.

At the conclusion of the second 15- to 20-minute period, we then go into the 30- to 35-minute exercise. This again is an expansion of the same subject. He has spoken on this particular subject for 15- to 20-minutes using the conference as his method of presentation. He will now use this same subject and expand it to 30- to 35-minutes. Again this is designed to give him

additional practice in further researching, practice in flexibility of presentation, in timing, and in effectiveness.

We have progressed at this time from 2, 3, 5, 10, 15, 20, up to 30 and 35 minutes. Now we are coming down the stretch. At this time we interject a 3-minute presentation on an impromptu subject. And why do we do this? In order to test the flexibility of the individual. Is he effective when speaking on a subject of which he has no knowledge? Just prior to coming up to the platform we hand the individual his subject and we allow him a few minutes to collect his thoughts for a three minute lecture. At the conclusion of this presentation, we open the period up to questions at which time the individual, having presented his three minute talk on the subject that we have given him, now must defend his position by taking questions from the floor and answering them, being as effective as he has been throughout his presentation, and leaving the same objectives in mind on the part of the student when he is finished. I would also like to mention at this time that during this three-minute impromptu presentation, we use subjects which we have given formally from the platform. For example, what are the principles of proper lesson preparation? What are the advantages of the conference over the lecture? How do we properly use training aids, things of this kind. All based on the fact that we are all not only trying to observe his flexibility, but it affords us an opportunity to realize whether or not he has an understanding of the fundamentals that we have taught on a formal basis. At the conclusion of the three minutes, we will go into the beginning of his final presentation.

Let's go back to when the officer or noncommissioned officer was initially assigned, having been placed in a department and further to a committee. The committee chairman, realizing that the individual must go through the Instructor Training Section before he is allowed to formally present instruction from the platform, will designate a given problem within that committee, that the individual will present during his final examination in this course. So throughout these practical exercises, the individual student instructor realizes that when it comes time for his final examination he will give this particular problem. So all during this he has been working on his preparation for his final. You notice that we have two approaches. One is the rehearsal and then, of course, the final examination which is a performance exercise. We have the rehearsal for one reason. It allows us to critique him in the area, this being the first time we have heard him present fifty minutes of instruction based on a formal period as conducted here at the School. We judge him strictly on his effectiveness for learning. Did he communicate? Did he get these things across to his audience? On the critique we discuss the little things perhaps he hasn't considered during his presentation. Once armed with these facts, then he will replan and modify where necessary and then, of course, the next presentation will be his final. Again there is just one thing we are looking for, the effectiveness of this individual to present effective instruction.

During each of the practical exercises that I have discussed, we evaluate the individual from the standpoint of his effectiveness, his speech techniques, his poise, his platform manner, things of this kind all the way along. And after having given these nine exercises he has had a very good knowledge of the fundamentals of not only proper preparation but proper presentation as well. Two-thirds of the course - 2/3 of the time alloted to this course - is spent on conducting practical exercises. The other 1/3 is devoted to formal instruction conducted by an officer or noncommissioned officer of the Instructor Training Section to the class as a whole. Now this time is so spread as to immediately precede the practical application by the student. For example, just before he goes into his ten minute presentation we will conduct here a formal period of instruction on lesson planning and procedures used in planning the lecture and conduct of the lecture. Once armed with these facts then, he will leave the classroom and begin to prepare his practical approach armed with those essentials that he must have in order to understand proper procedure. This is done throughout the course.

This course, as I said initially, is designed to increase the potential of the individual or to assist him in developing his ability. However, it also is designed to instill confidence in the individual which he must have. Further, it allows him to familiarize himself with the standards and the policies of the school and the Assistant Commandant. Lastly, it provides opportunity throughout these various periods for the student to evaluate himself in the light of his strengths and his weaknesses. We teach him to capitalize on those things that he has as his strengths. Through individual counseling conducted by the group instructor we will counsel the individual on means and ways by which he can overcome the weaknesses that he has a tendency to show. All of this is done to make him as effective as possible in formal presentation.

CHAPTER 13

ASSISTANT COMMANDANT'S FORUM

BRIGADIER GENERAL STANLEY R. LARSEN

GENERAL LARSEN:

We hope that you have gained as much information as you came here to obtain, on the latest changes in Infantry concepts, doctrine, weapons and equipment that have occurred in the past year; and that you will be able to make good use of this information when you return to your home stations. Bear in mind that the Infantry is a progressive branch and that it has a definite responsibility for its role on future battlefields.

The members of the faculty who are responsible for the information you have received this week are prepared to discuss or answer any final questions or comments which you may desire to give or to ask in these final closing minutes of our week's conference. The forum is now open to any questions you may have, or any subject that you desire to bring up for clarification.

QUESTION:

Is it still planned to implement the regimental combat arms system, and when might we see this come into the picture?

ANSWER:

The Infantry School has no knowledge as to when this system will be implemented.

QUESTION:

What are the main considerations when selecting the various maps to be used with problems? Do you try to use as many different maps as you can from many different countries?

ANSWER:

Last year the Infantry School instigated a policy of getting all of our tactical problems out of Germany, France and the U.S. and starting a diversification program utilizing available maps of countries throughout the world including a few of the communist countries.

QUESTION:

What is the current status of active divisions reorganizing to the new type organization?

ANSWER:

To our knowledge the Fourth Division is the only division, to date, which has reorganized under the new TOE. The new TOE is not scheduled for publication until some time this fall.

QUESTION:

During the course of the conference considerable emphasis was given to the problem of increasing the kill probability of some of the current Infantry weapons. Has the Infantry School given any consideration to the organization, perhaps in the combat support company, of a platoon or section equipped with a multiple T238 toxic chemical rocket launcher which would be organic to the Infantry?

ANSWER:

The Infantry School has not given consideration to it. We have considered chemical weapons. The problem we have today is to find enough people to man the weapons we already have or the higher priority weapons that we are going to get in the future. In most cases the new weapons have been given to us with the proviso that they replace existing weapons.

GENERAL LARSEN:

I would like to thank you for your attentiveness, your suggestions, your comments, your personal appearances before various people in the School to give us some of the background you have to offer and for the questions you've asked. You've made some very constructive comments pertaining to this conference, which I am sure will benefit us when we prepare next year's. I hope we will again meet at other crossroads.

CHAPTER 14
COMMANDANT'S CLOSING REMARKS

MAJOR GENERAL PAUL L. FREEMAN, JR.

I want to express my regrets for not having been able to spend more time with this group. I have barely been able to catch a glimpse of you, but I assure you this was not my choice. I think this is one of the most important meetings held here at Fort Benning. I would very much have liked to be with you during this conference; to have learned what I believe you learned and to have heard your comments and questions; but unfortunately we have a lot of activities going on here at Fort Benning, and I can only be in one place at a time. So much for my apologies.

There are a couple of thoughts I would like to leave with you before you go. First, I hope you have received the feeling since you have been here that the Infantry is progressive. There are a lot of dedicated people here at Fort Benning, and in the Infantry as a whole, who are trying to do things--who are looking ahead. We can think of many improvements that can be made in organization, in tactics, mobility, and weapons of all different kinds and in many other things. Unfortunately, there are limitations. The limitations that we in the Infantry and, indeed, that all branches in the Army are feeling at this time are (1) manpower and (2) material resources, or if you prefer, money.

There is no substitute for manpower. Ever since our reorganization into a pentomic Army we have been plagued with manpower problems rising out of this reorganization. The Chief of Staff unfortunately had to place a limit on the Army. We could not have one additional man, soldier or officer, in any type of a job. In reorganizing the ROCID division, he would not authorize even one additional man. Thus, any necessary adjustments had to be made within the established manpower ceilings. As you recall, the main adjustment made was that of beefing up the Artillery. I believe that was sound; we did not have enough conventional Artillery. We were grateful for the major reorganization in the battle group--5 rifle companies and a combat support company. We are obtaining new equipment, such as surveillance devices and more sophisticated antitank weapons, all of which require more transportation, more communications. To try to accomplish changes such as the integration of this new equipment without an increase in manpower is well nigh impossible.

The second limitation is money and material. To those of us who believe in it, our pentomic division is very sound in concept. It is certainly devised for modern warfare. I was all for that beefed-up regimental combat team of the old division. I think it was superb. We were grateful for having it in the early days of Korea. However, when we consider our current national strategy, we have to admit that the old regimental combat team is outmoded. It was too heavy, too cumbersome. It just couldn't get where it had to go fast enough. We have to have this new light pentomic division. But this light organization can function and can fight only if it receives the improved material that it was promised. It must have greater firepower, but greater firepower isn't here yet. In this connection, we often talk about the Davy Crockett which is supposed to be right around the corner. But what about the M14 rifle and the M60 machinegun, the new hand grenades and the other simple little things, which are not really so simple or so little when you consider their dollar cost. We don't have even these simple things yet, and if we are called upon to fight in this loose, light organization without this equipment, I am afraid that we would get a very bloody nose.

All of this leads up to the much broader problems of the Army, which are beyond our scope here at the Infantry School. I don't have the knowledge to discuss them, certainly, and no criticism is implied, but all of us who can read the papers and the service journals must wonder where we are going.

It seems to me that the Army today, with our critical money and manpower situation, is stretching itself very thin. We are still supposed to be a ground force with the mission of sustained ground combat. This is our basic mission; this is what we tell the public, the Congress, and the other branches. We jealously defend this mission and we strive zealously to accomplish it. However, we are not getting enough money in the ground combat forces to do this job. We are putting our money into "also" type missions.

We are assigned the air defense mission. This is certainly an expensive mission. It is also one that has to be done, and the hardware to do it costs a lot of money. It requires our most intelligent and skilled manpower to operate the complicated equipment involved, but we need these same type people in the ground arms. We would be remiss if we did not make every effort to keep up in the space field; to look to the future. We can not deny that we must do this.

I am certain that you would be the last to say that we don't have to further develop and improve Army aviation. This is certainly an expensive mission. You only have to see the number of various type aircraft which we have at Lawson Field to obtain a first-hand look at just how expensive it is.

Thus, we are in a dilemma it seems to me. Fortunately, or perhaps unfortunately, I don't have to solve this problem. However, I think that it is a problem well worth your thinking over. Take it back with you to those other schools and institutions that you will soon return to, and listen to the discussions on their end of the line.

We are trying to do too much with the dollars that we have. First things are going to have to come first. Just where are we going to put these dollars? As I say, it is not my decision or yours, but it is certainly something that each of us in his own private mind ought to be thinking about.

I hope that what I have said will give you some food for thought. Perhaps, when you return to your own schools, these thoughts may give you ammunition to defend those things which you believe are first and foremost in importance, and to try to influence other people to your way of thinking.

I am very happy that you came here for this conference. I hope you found it as interesting and as worthwhile as we believe it is. I hope many of you will be back during the year and for this same meeting next year. We stand ready to help you in any way that we can -- any material, any ideas that you want, just drop us a line. It is good to see you all here, and the best of luck to you.

APPENDIX I

CONFEREES ATTENDING 1959
INFANTRY INSTRUCTORS' CONFERENCE
13 - 17 JULY 1959

INSTALLATION	NAME	RANK	SVC NR	BRANCH
Office of the Deputy Chief of Staff for Mil Opns Wash 25, DC	James K. Terry	Col	033375	Inf
Chief, Officer, Assignment Div TAGO, DA, Wash 25, DC	B. M. Read	Lt Col		Inf
	Clayton Moore	Lt Col		Inf
US Army Ordnance School Aberdeen Proving Ground, Maryland	Conrad R. Underdahl	Lt Col	033523	Inf
	William R. Hambrick	Lt Col	01315059	Inf
	Henry E. Lefebvre	Lt Col	036358	Inf
	James A. Curtis	Capt	062624	Inf
	Benjamin L. Gunter	Capt	062202	Inf
USARCARIB, Ft Amador, CZ	Carlos B. Ramirez	Lt Col	030524	Inf
	John S. Basye	Capt	01329673	Inf
US Army Air Defense School Ft Bliss, Tex	Robert L. Woolfolk, III	Lt Col	052687	Inf
	William C. Heard	Capt	069672	Inf
Quartermaster School US Army, Ft Lee, Va.	Jarvis K. Shaffer	Capt	059888	Inf
	James B. Saum	Capt	059878	Inf
US Army Ordnance Guided Missile School, Redstone Arsenal, Huntsville, Ala.	John R. Miller	Maj	01551072	Ord
	Raymond Hansotte	Maj	080098	Ord
US Army Finance School Ft Benjamin Harrison, Indiana	James H. Porteus	Capt	02086987	Inf
	Kenneth R. Darrington	Capt	062876	Fin Corps
Marine Corps Schools Quantico, Virginia	Jefferson D. Smith	Lt Col	011185	USMC
	H. W. Stankus	Lt Col	015865	USMC
Army Medical Service Sch Brooke Army Medical Center Ft Sam Houston, Tex.	James J. Meyers	Maj	01316181	Inf
US Army Security Agency Training Center and School Ft Devens, Mass.	Herman S. Chanley	Capt	01686318	Inf
US Army Command and General Staff College Ft Leavenworth, Kansas	Clyde V. Pickell	Col	031376	Inf
	Jack P. Geise	Lt Col	025131	Armor
	O. G. Kinney	Col	032067	Inf

INSTALLATION	NAME	RANK	SVC NR	BRANCH
US Army Artillery and Missile School, Ft Sill, Oklahoma	Ernest H. Wallace	Lt Col	037552	Inf
	Earl L. Harper	Lt Col	035272	Inf
Provost Marshal General's School, US Army, Ft Gordon, Georgia	John Synowsky	Maj	01310172	Inf
	Charles G. Ross	Maj	060623	Inf
US Army Transportation Sch Ft Eustis, Virginia	Wyndham H. Bammer	Lt Col	036903	Inf
	Guy A. Eberhardt	Capt	069639	Inf
US Army Chemical Corps Sch Ft McClellan, Alabama	H. R. Jacobs	Maj	01170786	Inf
	Norman Shapira	Lt Col	060239	CmlC
US Women's Army Corps Cen Fort McClellan, Alabama	Mary E. Kelly	Lt Col	L 341	WAC
	Rosa T. Lawton	Maj	L 254	WAC
US Army Armor School Ft Knox, Kentucky	Fred E. Allen	Maj	080031	Inf
USA Interchange Off Gp. OUSARMA, Ottawa, Canada	Royal B. Brown	Maj	080050	Inf
Adj General's School US Army, Ft Benjamin Harrison, Indiana	Sigurd Olson	Capt	02045324	Inf
	J. F. Reyburn	Maj	01055709	AGC
US Army War College Carlisle Barracks, Pa.	Norman Farrell	Col	021759	Inf
US Army Signal Training Cen Ft Gordon, Georgia	Joseph A. Brunner	Lt Col	0292275	Inf
	Charles R. Petit	Capt	01923556	SigC
United States Military Academy, West Point, N.Y.	Frank E. Blazey	Maj	028693	Inf
The Signal School Ft Monmouth, N.J.	John F. Sullivan	Lt Col	081266	Inf
	Lawrence P. Connors	Lt Col	01290903	Inf
The Army Aviation School Ft Rucker, Alabama	Paul C. Swink	Capt	02001124	Inf
	J. V. Mackmull	Capt	062677	Inf
The Judge Advocate General's School, Charlottesville, Va.	John G. Lownds	Maj	038211	Inf
	Herbert C. Byrd	Maj	084348	Inf
US Army Chaplain School Ft Slocum, N.Y.	Richard R. Bell	Lt Col	043201	Chaplin
	David E. Kinsler	Col	041759	Chaplin
US Army Advisory Group Air Command and Staff College, Maxwell AFB, Ala.	George C. Morton	Lt Col	039010	Inf

INSTALLATION	NAME	RANK	SVC NR	BRANCH
US Army Engineer School Ft Belvoir, Virginia	Aaron C. Brown Charles J. Shoemaker, Jr.	Maj Capt	0410800 062274	Inf Inf
US Army Special Warfare School, Ft Bragg, N.C.	Randall H. Bryant T. P. Iuliucci	Col Lt Col	031785 04848	Inf Inf
The Army Primary Helicopter School, Mineralwells, Texas	Gilbert R. Hickenbottom	Capt	01926388	Inf
US Army Intelligence School Ft Holabird, Md.	Virgil E. Craven William T. Aikin	Lt Col Maj	034824 01311591	Inf Inf
US Naval Amphibious Base Little Creek, Va.	William J. Ankley	Capt	065259	Inf
Hq USCONARC Ft Monroe, Virginia	R. P. Blanks Trevor E. Williams	Lt Col Lt Col	01284637 032883	Inf Inf
Naval War College Newport, Rhode Island	R. G. Fergusson	Col	020297	Inf
USAFAIR Ground Operations School, Keesler AFB, Miss.	Richard H. Durst	Lt Col	080402	Inf
Luke Air Force Base Glendale, Arizona	L. A. Brown	Lt Col	084345	Inf
Naval Training Devices Cen Port Washington, N.Y.	M. A. Whitfield	Lt Col	036389	Inf
Naval Training Devices Cen Jacksonville, Fla.	Thaddeus A. Wilkinson	(Civ)		
Combat Surveillance and Target Acquisition Comd Ft Huachuca, Ariz.	Earl P. Hopper Carl E. Goldbranson	Maj Capt	01308338 060451	Inf Inf
US Army Armor School Ft Knox, Kentucky	E. L. Megg W. F. Kingry	Lt Col Maj	035474 01826240	Inf Armor
Electronic Proving Gnd Ft Huachuca, Ariz.	W. H. Greer	Lt Col	0323944	Inf
Hq USCONARC Ft Monroe, Virginia	I. J. Richardson	(Civ)		

APPENDIX II

DISTRIBUTION

DISTRIBUTION:

Headquarters, United States Continental Army Command	50
Conferees listed in Appendix I	2 each
Conferees' Headquarters listed in Appendix I	4 each
Senior Army Advisors, National Guard	1 each
Senior Army Advisors, USAR	1 each
Commanding Generals, Airborne Infantry or Infantry Divisions	5 each
Chiefs, Military Assistance Advisory Groups & Military Missions	5 each
The United States Army Infantry Board, Fort Benning	5
The United States Army Infantry Center	40
The United States Army Infantry School	300